

PRACTICAL PROBLEMS
IN TEACHING METHOD

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*Case Studies of Teaching Method in the
Post-Primary School*

BY

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With a Foreword by

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TO MY FATHER
JAMES ANDERSON
IN MEMORY OF HIS LIFELONG
DEVOTION TO THE CAUSE OF EDUCATION

FOREWORD

My one-time student, Mr. D. F. Anderson, has had for some years the task of training teachers in a part of China where it is difficult for his students to see enough teaching on European (or American) lines, especially good teaching. It therefore occurred to him that it might be well to bring back from his furlough in Scotland the verbatim accounts of a number of lessons, and that there would be the additional advantage that these lessons could then be discussed and criticised at leisure, with an exact knowledge and not merely a somewhat confused memory of what happened. Later, it seemed to him possible that other trainers of teachers in less remote places might like to possess such reported lessons; hence their present publication.

It is of course true that printed reports of lessons have disadvantages as well as advantages in comparison with lessons actually listened to and then discussed. The advantages are that the trainer can prepare more thorough questions on them, such as those given in this book, and can choose lessons to illustrate a point; whereas the actual demonstration or criticism lesson which follows a lecture on (say) "questioning" may turn out to be singularly devoid of illustrations of that topic, though rich in others. On the other hand, a printed account loses something of the warmth and vitality of the experienced lesson. It is "fossilised" to some extent, though to a less extent for the reader who is also a teacher, and who can readily picture the scene in the classroom. But just as the surgeon learns his anatomy on the dead body, so the future teacher may learn by dissecting these "corpses" of lessons, as Mr. Anderson pleasantly calls them: and it was but in keeping with a tradition now over a century old that his body-snatching should be done in Edinburgh.

The band of nameless martyrs—all experienced and successful teachers—who voluntarily admitted this modern Burke and Hare, Mr Anderson and his shorthand writer, into their classrooms must have known well what a risk they were running. A really accurate verbatim report is to speech or lesson what the tell-tale mirror or the untouched and sharply focused photograph is to features and complexion. It was said of a famous and eloquent statesman, who had offended the Pressmen by impugning their accuracy, that he bitterly regretted his indiscretion when in revenge they reported his next speech in pitiless detail—errors and flounderings complete. Yet it probably sounded all right to his hearers, carried over the faults in sentence-construction and the long asides by the tones and gestures of the speaker. So these lessons must not be judged too harshly by the reports. “There,” the reader who is a teacher should say, “there go I,” and if he cares to add, “but for the grace of God,” he may do so. Perhaps this book may give a little assistance too.

Some little touching-up there has been. Names of teachers and schools, where they happened to occur in question or answer, have naturally been removed, though not, I notice, the name of master H. . . .¹ who is suddenly given good but apparently unprovoked advice in the midst of a talk on Australian gold, “Well, you try and be bright.” How, I wonder, had he drawn that upon himself? And I could have wished that some of the interruptions had been left in—the janitor who wanted a show of hands of the boys taking golf lessons, faithfully recorded by the shorthand writer, has disappeared in print. Nay, I would have liked marginal notes of other interruptions; the one-man band in the street outside, or the upset inkpot, which all go to make or mar a lesson. That errors of method should be left in was of course essential to the purpose to which the reports are to be put. The occasional errors of fact made by the teacher, or left uncorrected by him (the Dogger Bank near Newfoundland), are also all there.

¹ Ah! I see in proof that he has been reduced to a block capital.

The chief impression made on my mind is a feeling of how little is done in so many lessons. To counteract this, one must remind oneself that lessons which can be listened to by a visitor or reported by a shorthand writer are not the only lessons on a school time-table. There are the numerous hours when the pupils are silently doing work, to be corrected afterwards by the teacher, or when, in some schools, they are doing individual and to some extent self-corrective work. And among the questions appended to these lessons are many asking the student what form of drill, repetition, or written work could suitably follow in order to consolidate the knowledge gained, and add to it.

Yet the ability to give a good "Platform lesson," to keep thirty or more diverse minds simultaneously interested, to question with skill and efficiency, to use the blackboard, these remain indispensable to a teacher, and it is a pleasure to welcome a book which makes an original and I think most useful contribution to the problem of how to inculcate or encourage these qualities.

GODFREY H. THOMSON.

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PREFACE

THIS work constitutes a report made to the Scottish Council for Research in Education, which sponsored the investigation and afforded support and financial aid for the reporting of the lessons.

The writer's sincere thanks are due to the Council and also to the following:

The Directors of the London Missionary Society, for releasing him from other duties for four months in order to undertake this study.

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DAVID F. ANDERSON.

EDINBURGH,
November 1938.

INTRODUCTION

ON THE USE OF THIS BOOK

THIS work is an attempt to find a new approach to the problem, "How can we best train the student of education in the practical technique of teaching?" Among the solutions commonly found are:

1. Courses of lectures on method.
2. Practice teaching.
3. Observation of teaching.

1. In courses on methods of teaching the lecturer analyses the methods used by good teachers and expounds the principles involved to the student in training. Such courses have their value, but they are open to the fundamental objection that they treat teaching as a science rather than as an art. An intelligent student may quickly assimilate the principles set forth in the lectures or text-books on method, but that in itself is no guarantee that he will be able to apply those principles to his own practice in the classroom. In fact, it sometimes appears as if the student, while actually teaching, falls back, not on the principles studied in the methods class, but on the example of the teachers by whom he himself has been taught. Yet it is incontestable that, if there is to be any advance in the general level of teaching technique, it must come through the student consciously applying to his own practice the principles underlying better methods of teaching.

2. Another solution of the problem is the use of practice teaching. Here the student assumes responsibility for teaching individual lessons or a whole course under the supervision of a methods lecturer. By many teachers this type of training is felt in retrospect to have been the most valuable

single element in their whole training, as it gives the student a practical situation in which to apply the principles of method under the guidance of the lecturer. The chief objection to it from an administrative point of view is its costliness in time and money. To have a methods lecturer spend a large number of hours each week listening to and criticising students' practice lessons can never be a cheap method of training, though equally it is a method which cannot be dispensed with. If a student's practice teaching were to be limited only to lessons which his lecturer could attend, then he would enter his profession with a very inadequate background of practical experience. On the other hand, to allow the student to teach without some such expert supervision is to run the risk of his developing bad habits of technique through lack of guidance—not to mention the waste of the pupils' time through inefficient teaching.

3. A third solution of the problem of practical training offers a compromise by assigning to the student a certain amount of observation of experienced teachers. At its lowest, this amounts to little more than having the student sit in the class and keep a record of the work done. The obvious weakness of this method of training is that the student often does not know what to look for in the teaching which he is observing, and may even be unable to recognise its good or bad points, far less to see how the principles of method are being applied, misapplied, or neglected. The use of special work-books,¹ or guides to observation, has to some extent remedied this weakness, for the student is then asked to write answers to a series of questions applying some particular principle to the lesson observed. Sometimes, however, trouble arises from the fact that the lesson observed may fail completely to exemplify the principle on which the questions were based. For example, the lesson may be of the appreciation type, while the questions set are on the subject of deduction. Even where this difficulty can be partly avoided by careful organisation, there are still the obstacles of

¹ For example, C. E. Reeves : *Workbook in High School Observation and Practice Teaching*.

the heavy load of correction involved for the lecturer, and the difficulty of assessing the value of answers to questions on a lesson which he himself has not observed.

The present book is the outcome of an effort to find an alternative to the observation method. It might be called "the dissection method"! Here are presented the "corpses" of seventeen lessons—verbatim reports of what was said by teacher and pupils in the course of the lessons, and appended to each report are several "questions and exercises." It will be apparent that it is not just another exposition of the general principles of method, though it presupposes that the student has already studied these principles. Its intention is to supply a concrete teaching situation in the verbatim report, and then by means of the questions to require the student to show how certain principles have been, or might be, applied to it. In short, these questions may succeed in doing what observation of teaching usually fails to do, namely, compel the student to make conscious applications of the principles of method to practical teaching. A further advantage of this procedure is that, whereas in observation lessons questions and answers flash past before their full significance can be grasped, in these lessons the student can read and re-read the reports, and has time to study all the implications. Only so can the inexperienced student-teacher grasp the teaching situation with sufficient thoroughness to make an intelligent application of the principles of method.

SOME PRACTICAL POINTS

While a few teachers may care to use this book for individual study, it is meant primarily for use by a tutorial group of students in training under the direction of a methods lecturer. The teaching will take the form of oral discussion between members of the group and the lecturer on the basis of the questions and exercises, after the students have made themselves thoroughly familiar with the contents of the report of the lesson. Some questions will call for written answers, which can

then be read out for discussion and criticism by the other members of the class, or handed in for correction by the lecturer.

As the original intention was to use these materials in training teachers for secondary schools, the lessons selected were all taught in schools of a post-primary grade. At the same time, it was found that the more advanced classes of the secondary school provided material that was less suitable for the purpose. The book, therefore, may be of use to students training for work in the senior school.

Occasional references are made in the "Questions and Exercises" to certain text-books on general method at the secondary school stage. A list of these references is given below. It is offered, not as a complete bibliography on methods of teaching, but merely to indicate the principle which the writer had in mind in framing the questions. Similar references could be found in many other books not listed here.

In conclusion, the reader is reminded that this work is in the nature of an experiment. So far as the writer is aware, there is no book in general use which approaches the problem of training in the technique of teaching from quite the same angle. He would therefore be grateful if any who use it would communicate their criticisms or suggestions to him through the publishers of this work. If this type of approach should prove its usefulness, it is hoped that others with fuller experience will undertake its application to the methods of teaching the various subjects of the curriculum.

REFERENCES

- Bossing, N. L.: *Progressive Methods of Teaching in Secondary Schools* (Harrap).
Cole, P. R.: *Method and Technique of Teaching* (Oxford University Press).
Colvin, S. S.: *An Introduction to High School Teaching* (Macmillan).

Morrison, H. C.: *The Practice of Teaching in the Secondary School* (University of Chicago Press).

Reeves, C. E.: *Standards for High School Teaching* (Appleton).

Ruediger, W. C.: *Teaching Procedure* (Harrap).

Waples, Douglas: *Procedures in High School Teaching* (Macmillan).

Washburne, Carleton : *Adjusting the School to the Child* (Harrap).

I

ENGLISH LITERATURE—PROSE

CLASS: Second-year (age 13-14) of 39 boys

TITLE OF LESSON: "THE GIANT SQUID" (*Clarendon Readers in Literature and Science, Book II, pp. 232-3*).

Teacher. First of all you have to know something about the story from which this passage is taken. This little passage is from what you might call quite fairly one of the greatest sea stories ever written. It is certainly a book you ought to read. It will take a long time, but it is well worth while. Its name is *Moby Dick*, and it is by an American author called Hermann Melville. He had an exciting life. He ran away to sea at the age of 16, and after a while there he went back to America. Afterwards he went off on a long cruise, was wrecked on a desert island, where he was captured by cannibals, and after four months in their hands he escaped and returned to New York. After various other adventures he settled down and became an author. He wrote practically his own life story. This one describes the chase of the sailing-ship *Pequod* after the great white whale, Moby Dick. The whale fishermen had a kind of hatred for the whales.

It took them to the region where Moby Dick was supposed to exist. Moby Dick was a sperm whale—not the kind of whale you see at the Museum or like that one that was washed up at Port Seton some time ago and created the awful smell, but a sperm whale, enormous and several hundred feet long. They thought they would try to capture it for a special kind of oil they got out of its head, called spermaceti oil.

The book called *Moby Dick* describes the chase after that

whale. *Pequod*, the sailing-ship in which the hero sets sail, is captained by a strange figure, Ahab, who had a strange leg, not a wooden one, but a leg made of solid ivory. The story was that he had his leg taken off by Moby Dick in an encounter with that whale, and that he had an artificial leg made of solid ivory.

Now he is out on the hunt after Moby Dick, and means to get him or die in the attempt. He has a hatred of Moby Dick, and throughout the story you see him chasing one whale after another, and when he finds it is not Moby Dick, you see his disgust.

Now, does the name Moby Dick apply to any sperm whale?

Pupil. No, it applies only to Moby Dick, who was white in colour. The others are greyish in colour. They travelled an enormous distance and lived a long time.

Teacher. Yes, the author tells you that sometimes when whales were found with harpoons in them, some of them were discovered to be seventy or eighty years old.

Pupil. Please, sir, there was a film of *Moby Dick*.

Teacher. Yes, but I believe it was not a very good one. It brought in a love story and that sort of thing. The real thing is pure adventure. Well, to get on with it, remember that Ahab, in the *Pequod*, is pursuing this white whale, Moby Dick. Well, read on.

Pupil reads:

"Slowly wading through the meadows of brit, *Pequod* still headed on her way north-eastward towards the island of Java, a gentle air impelling her keel, so that in the surrounding serenity her three tall, tapering masts mildly waved to that languid breeze.

"And still, at wide intervals in the silvery night, a lengthy alluring jet would be seen."

Teacher. This reference to "jet." That is a spray. When a whale breaks surface, it throws up a spray. When he saw it

Ahab felt certain that it was Moby Dick luring them on. What does "alluring" mean?

Pupil. Enticing.

Pupil reads:

"But one transparent blue morning, when a stillness almost preternatural brooded over the sea, however unattended with any stagnant calm; when the long burnished sun-glow on the waters seemed a calling finger laid across them, enjoining some secrecy; when the slippered waves whispered together as they softly ran on; in this perfect hush of the visible sphere a strange spectre was seen by Daggo from the main-mast-head."

Teacher. This Daggo was one of the crew. He was a harpooner or harpooneer, and it was he who saw this strange vision. He was a Pacific Islands native. How did they catch a whale?

Pupil. They lowered the boats and the men went after it with harpoons.

Teacher. But where was the rope they used?

Pupil. In a barrel.

Teacher. No, curiously enough, it was coiled round the ship. There was not enough room for it in a barrel. Some of the white men would not go out after the whales, so they employed natives of the South Seas, who stood up in the prows of the little boats and threw the harpoon which had the rope attached to it. The novel gives a very vivid picture of how, when the natives threw the harpoon, they would row away as fast as they could, and how the whale would rush along the surface, pulling them along with him. The idea was that another boat would then go up and harpoon the whale again. If there were several boats joining in this, the whale would soon be killed.

Pupils read by turns:

"In the distance a great white mass slowly rose, and rising higher and higher, and disentangling itself from the azure, at last gleamed before our prow like a snow-slide, new slid from the hills. Thus

glistering for a moment, as slowly it subsided and sank. Then once more arose and silently gleamed. 'It seemed not a whale; and yet, is this Moby Dick?' thought Daggoo. Again the phantom went down, but on reappearing once more, with a stiletto-like cry that startled every man from his nod, the negro howled, 'There, there again! There she breeches! Right ahead! The white whale, the white whale!' Upon this, the seamen rushed to the yards-arms as in swarming-time the bees rush to the boughs. Bare-headed in the sultry sun, Ahab stood on the bow-sprit, and with one hand buried far behind in readiness to wave his orders to the helmsmen, cast his eager glance in the direction indicated aloft by the outstretched, motionless arm of Daggoo.

"Whether the flowing attendance of the one slow and solitary jet had gradually worked upon Ahab, so that he was now prepared to connect the ideas of mildness and repose with the first sight of the particular whale he pursued; however this was, or whether his eagerness betrayed him; whichever way it might have been, no sooner had he distinctly perceived the white mass than with a quick intensity he instantly gave orders for lowering.

"The four boats were soon on the water; Ahab's in advance, and all swiftly pulling towards their prey. Soon it went down, and while, with oars suspended, we were awaiting its reappearance, lo! in the same spot where it sank, once more it slowly rose. Almost forgetting for the moment all thoughts of Moby Dick, we now gazed at the most wondrous phenomenon which the sacred seas have hitherto revealed to mankind. A vast, pulpy mass, furlongs in length and breadth, of a glancing cream colour, lay flat in the water, innumerable long arms radiating from its centre and crawling like a nest of anacondas, as if blindly to catch at any hapless object within reach. No perceptible face or front had it, though; no conceivable token of either sensation or instinct; but undulating there on the billows, an unearthly, formless, chance-like apparition of life.

"As with a low, sucking sound it slowly disappeared again, Starbuck still gazing at the agitated waters where it had sank, with a wilted voice exclaimed: 'Almost rather had I seen Moby Dick and fought him, than to have seen thee, thou white Ghost!'

"'But what was it, sir,' said Flask; 'but a great live squid, which, they say, few ships ever behold, and return to their ports to tell of it?'

"But Ahab said nothing; turning his boat, he sailed back to the vessel, the rest as silently following."

Teacher. You see Starbuck mentioned. He was one of the men in the crew. Why was Starbuck so afraid when he saw this monster? What was the superstition he believed in?

Pupil. That when the whalers saw a giant squid, it was unlikely they would return to port.

Pupils read:

“Whatever superstitions the sperm whalemén in general have connected with the sight of this object, certain it is that a glimpse of it being so very unusual, that circumstance had gone far to invest it with portentousness. So rarely is it beheld, that though one and all of them declared it to be the largest animated thing in the ocean, yet very few of them have any but the most vague ideas concerning its true nature and form; notwithstanding, they believe it to furnish to the sperm whale his only food. For though other species of whales find their food above water, and may be seen by man in the act of feeding, the spermaceti whale obtains his whole food in unknown zones below the surface, and only by inference is it that anyone can tell of what that food consists. At times when closely pursued, he will disgorge what are supposed to be the detached arms of the squid; some of them thus exploded exceed twenty or thirty feet in length. They fancy that the monster to which those arms belong ordinarily clings by them to the bed of the ocean, and that the sperm whale, unlike other species, is supplied with teeth in order to attack and tear it.

“There seems some ground to imagine that the Great Krakin of Bishop Pontoppodan may eventually resolve itself into the squid. The manner in which the Bishop describes it, as alternately rising and sinking with some other particulars, in all this, the two correspond. But much objection is necessary with respect to the incredible bulk he assigns to it.

“By some naturalists who have vaguely heard rumours of the monstrous character here spoken of, it is included among the class of cuttle-fish, to which, indeed, in certain external respects it would seem to belong, but only as the Anak of the tribe.”

Teacher. “The Anak of the tribe.” What does that mean? What about the sons of Anak?

Pupil. They were giants.

Teacher. So that when the writer says that this squid was the Anak of the cuttle-fish tribe, what does he mean?

Pupil. The giant of the cuttle-fish tribe.

Teacher. Yes, an enormous cuttle-fish.

Pupil. A thing like an octopus.

Teacher. Yes; I see he says it was an enormous length. And it had no face. It was nothing but a pulpy mass with long tentacles sticking out. It is wonderful how we always have a horror of anything without a face. Do any of you remember any of H. G. Wells's stories on those lines?

Pupil. Yes, I think I remember one where a giant monster came out of the sea on to an island and ate several people.

Teacher. No, I was thinking of another, *The Island of Dr. Moreau*. That is a horrible story about a doctor who tries to graft one animal on to another and produces horrible creatures, some with one eye and some with three eyes. Then they all get loose on an island and the hero gets in among them. It is a particularly horrible tale, and I strongly advise you not to read it. You should make a note of it (*laughter*).

“One transparent blue morning.” What does that mean?

Pupil. There was no fog or anything.

Teacher. Well, there was a perfectly clear view. You don't usually talk about the morning being “transparent.” What do you apply to transparent?

Pupil. Glass.

Teacher. Yes, something you can see through. Do you know its derivation.

Pupil. *Trans*, across.

Teacher. No, *trans*, through, and *parere*, to appear. I see he talks here of a stillness almost preternatural. What's the meaning of preternatural?

Pupil. Supernatural.

Teacher. No, it is something quite different. The prefix is derived from the Latin word, *praeter*, meaning past or almost beyond.

Pupil. Yes, it means almost beyond the natural.

Teacher. It might refer to spirits or something like that. What does he mean by stagnant?

Pupil. Not pure.

Teacher. Not that.

Pupil. Not moving.

Teacher. Something different.

Pupil. Something rotten, going bad.

Teacher. What does he mean by the sun-glow?

Pupil. Water like glass.

Teacher. I think he means the sun was shining like a path across the water. What does he mean when he says the sun-glow seemed a calling finger. What figure of speech is that?

Pupil. Simile.

Teacher. Something else.

Pupil. Metaphor.

Teacher. "When the slippered waves whispered as they softly ran on." That is a curious phrase. Why does he call the waves "slippered"?

Pupil. They were very quiet.

Teacher. Yes, as if they wore slippers. What figure of speech is that ?

Pupil. Metaphor.

Teacher. "The waves whispered." What figure of speech is that ?

Pupil. Metaphor still.

Teacher. "In the distance a great white mass slowly rose, and rising higher and higher, and disentangling itself from the azure." What is the meaning of azure ?

Pupil. The sky.

Teacher. Actually, it refers to the blue of the sea. "Gleamed before our prow like a snow-slide." What figure of speech is that ?

Pupil. Simile.

Teacher. Why did Daggoo think it was Moby Dick, and yet not be sure that it was a whale ?

Pupil. Its white colour. It was unusual.

Teacher. A stiletto-like cry. What sort of cry was that ?

Pupil. A sharp cry.

Teacher. Yes; what is a stiletto ?

Pupil. A dagger.

Pupil. A rapier.

Pupil. A very sharp knife about six inches long.

Teacher. In which country are they used ?

Pupil. In Italy.

Teacher. Yes, they have a very sharp and narrow blade. They can be thrown if necessary (*laughter*).

Teacher. “The negro cried, ‘There she breeches.’”
What does “breech” mean?

Pupil. Breaks the waves.

Pupil. There she blows.

Teacher. What figure of speech follows that: “The seamen rushed to the yards-arms as in swarming time the bees rush to the boughs”?

Pupil. Simile.

Teacher. “With oars suspended.” What does that mean?

Pupil. Lifted out of the water.

Teacher. “A vast, pulpy mass, furlongs in length.” What is a furlong?

Pupil. An eighth of a mile.

Teacher. What do you mean when you are running the furlong. How long is it?

Pupil. “The 220.”

Teacher. He implies that it was about a quarter of a mile long—about as far as from here to the post office. I think we shall have to allow a little for exaggeration.

Pupil. Well, he was an American (*laughter*).

Teacher. Well, maybe. At any rate, he was a poetic sort of writer, and means to tell us it was an enormous mass. He says it had innumerable long arms. Give me another word for innumerable.

Pupil. Unaccountable.

Pupil. Numerous.

Pupil. Not able to be numbered.

Teacher. Numberless.

Teacher. "Radiating from its centre." What is he comparing it with?

Pupil. A circle.

Teacher. What are anacondas?

Pupil. Snakes.

Teacher. Give me another word for "hapless."

Pupil. Unlucky, luckless.

Pupil. Unfortunate.

Teacher. Yes, unfortunate. Give me another word for "perceptible."

Pupil. Perceivable.

Teacher. Yes, that which can be perceived.

Teacher. This curious creature had no control over its movements. It "undulated in the billows." That word "undulated" is interesting. What is its meaning?

Pupil. Forming waves.

Teacher. Yes, like waves, a series of waves. I see he talks of it as an "apparition." That is, something not quite earthly. It has a different meaning from the word "appearance." You can talk of the appearance of Campbell, but if you spoke about the apparition of him, it would be a different matter. His appearance is something quite normal.

QUESTIONS AND EXERCISES

1. Divide the lesson into its various phases. (For examples see H. C. Morrison, *The Practice of Teaching in the Secondary School*, Chapter VIII).

What is the principal aim of the lesson as a whole?

What are the aims of each phase of the lesson?

2. Discuss whether the introductory lecture by the teacher is a justifiable use of the lecture method.

Why could the aim of this phase of the lesson not have been attained as well by some other method, e.g. a pupil's report on the author's life, or by having the whole class read notes on the author (if such were provided in the book)?

Prepare a similar five-minute talk to introduce a lesson on one of the following topics:

- (a) An extract from *Little Women* or *Good Wives*.
- (b) First lesson on Archimedes's Principle.
- (c) Wilberforce and the abolition of the slave trade.
- (d) Some similar topic in your own subject.

Also draw up a list of six similar appreciation talks to introduce topics in your own subject (Cp. Reeves, *Standards for High School Teaching*, Chapter XVII).

3. What are the advantages and disadvantages of having the story read through first with a minimum of comment or questioning by the teacher?

What principle of appreciation teaching is involved in this procedure? (Cp. Ruediger, *Teaching Procedure*, Chapter IX.) Discuss the relative merits of the following alternative methods of first presenting the story to the class in the light of the same principle:

- (a) The teacher reading the story to the class—pupils' books shut;
- (b) The teacher reading the story, the class following silently;
- (c) The pupils reading it through silently at their own pace;
- (d) Oral reading by individual pupils with occasional comments by the teacher (the procedure followed);
- (e) Oral reading by the whole class or half the class in turn.

Now discuss the relative suitability of each of these methods when applied to teaching a short poem for the first time.

4. Examine (1) the teacher's comments and questions during the oral reading, and (2) his questions and comments made after the first reading was finished (middle of p. 6 to the end). How do they differ? To what extent might the later questions tend to increase or to decrease the pupils' enjoyment of the extract and their desire to read the whole story? (Cp. Reeves, *Standards for High School Teaching*, Chapter XVII.) What other aims does the teacher have for the course which necessitate the introduction of such questions? Discuss the relative importance of these aims as compared with the aim of the first part of the lesson.

5. What "creative work" would you have set the class to do in connection with this lesson? If none, justify your decision.

6. Do you approve or disapprove of:

(a) The humorous touches on p. 6, l. 20, and p. 8, l. 27?

(b) The digression about Wells's story on p. 6, ll. 10-20?

(c) The questions (p. 8). "What figure of speech is that?" as compared with "That is a curious phrase. Why does he call the waves 'slipperd'?" (p. 7, l. 26). (Cf. Reeves, *Standards for High School Teaching*, p. 332.) In each case defend your opinion.

7. Why was it necessary for the teacher to add a further question and then an explanation to the pupil's definition of a furlong as "an eighth of a mile"? (p. 9, l. 13).

8. In this type of lesson would you encourage such interruptions as p. 2, l. 20; p. 9, l. 20; p. 7, l. 8? What do such interruptions indicate of the relations between teacher and class?

II

ENGLISH LITERATURE—PROSE

CLASS: Third-year (age 13-14) of 26 pupils (Boys and Girls)

Teacher. Last period we were learning to build sentences. We will read a passage here to-day by one who knows how to build sentences. Turn up your book at page 79—"Artistic Attempts," by Louisa M. Alcott (*An English Heritage*, Book II).

Teacher reads:

"It takes people a long time to learn the difference between talent and genius, especially ambitious young men and women. Amy was learning this distinction through much tribulation; for, mistaking enthusiasm for inspiration, she attempted every branch of art with youthful audacity. For a long time there was a lull in the 'mudpie' business, and she devoted herself to the finest pen-and-ink drawings, in which she showed such taste and skill that her graceful handiwork proved both pleasant and profitable. But overstrained eyes soon caused pen and ink to be laid aside for a bold attempt at poker sketching.

"While this attack lasted, the family lived in constant fear of a conflagration; for the odour of burning wood pervaded the house at all hours; smoke issued from attic and shed with alarming frequency, red-hot pokers lay about promiscuously, and Hannah never went to bed without a pail of water and the dinner-bell at her door, in case of fire.

"From fire to oil was a natural transition for burnt fingers, and Amy fell to painting with undiminished ardour. An artist friend fitted her out with his cast-off palettes, brushes and colours, and she daubed away, producing pastoral and marine views, such as were never seen on land or sea. Her monstrosities in the way of cattle would have taken prizes at an agricultural fair; and the perilous pitching of her vessels would have produced sea-sickness in the most nautical observer, if the utter disregard to all known rules of ship-building and rigging had not convulsed him with laughter at the first glance.

"Charcoal portraits came next; and the entire family hung in a row, looking as wild and crocky as if just evoked from a coal-bin. Softened into crayon sketches, they did better; for the likenesses were good, and Amy's hair, Jo's nose, Meg's mouth, and Laurie's eyes were pronounced 'wonderfully fine.' A return to clay and plaster followed, and ghostly casts of her acquaintances haunted corners of the house, or tumbled off closet-shelves on to people's heads. Children were enticed in as models till their incoherent accounts of her mysterious doings caused Miss Amy to be regarded in the light of a young ogress. Her efforts in this line, however, were brought to an abrupt close by an untoward accident, which quenched her ardour. Other models failing her for a time, she undertook to cast her own pretty foot, and the family were one day alarmed by an unearthly bumping and screaming; and running to the rescue, found the young enthusiast hopping wildly about the shed, with her foot held firmly in a painful of plaster, which had hardened with unexpected rapidity. With much difficulty and some danger she was dug out; for Jo was so overcome with laughter while she excavated, that her knife went too far, cut the poor foot, and left a lasting memorial of one artistic attempt, at least."

Teacher. Well, that is all I am going to read. It is a little part taken from a bigger book. What do you call that?

Pupil. An extract.

Teacher. Yes, an extract. And from the reading of that little bit, do you think you would like to read the whole book?

Pupil. Yes. There is plenty of humour in it.

Teacher. Yes, I think most of us would say, "If that is a sample, I would like to go right through the book." Now turn back, and tell me what attracted you to that passage I read.

Pupil. The first sentence.

Teacher. Do you think it was an excellent opening?

Pupil. Yes.

Teacher. Let me read it again: "It takes people a long time to learn the difference between talent and genius, especially

ambitious young men and women.” There is a fine hint in this.

Pupil. Yes, in this story there is someone who is ambitious.

Teacher. Look how the author introduces Amy in the very next sentence. Look at the word “tribulation.” What does it mean?

Pupil. Distress.

Teacher. Yes, distress, very severe distress. Sorrow. I wonder if the author really means tribulation like that. There is a slight laugh here, because it does not mean the kind of tribulation that the word usually means. I want you to watch how skilfully this author uses her words. This is a passage by a master painter. Look at this phrase: “She attempted every branch of art with youthful audacity.” What does audacity mean?

Pupil. Boldness.

Teacher. What kind of boldness?

Pupil. Daring.

Teacher. If you had been writing this story, you might have used the word “boldness.” Do you think “daring” is better?

Pupil. Yes, it means an impertinent kind of boldness.

Teacher. What about this “mudpie” business? What do you suggest the girl has been doing before?

Pupil. Working with mud or clay.

Teacher. With clay or plasticine. Do you think “mudpie” is a good word to describe that?

Pupil. Yes, it is more humorous.

Teacher. Now just imagine I put one man in Princes Street to paint a picture of the castle. After he is finished, I put another man there, exactly on the same spot, in exactly the same weather. Do you think both pictures will be the same?

Pupil. No.

Teacher. Why not?

Pupil. They have different ideas.

Teacher. Yes, one man puts in what he thinks, and the other puts in what he thinks. The "mudpie business" is a good touch. But look at the last sentence of the paragraph. If we had been writing it, we might have said that Amy's eyes were becoming very tired with pen and ink, and she decided to make an attempt at poker sketching. Look how nicely the author puts it in one word "overstrained." That is good writing. Now look at the next sentence. The first word that made me smile was "attack." It is usually used in a serious way, but here it has a touch of humour that makes it quite different. Look at the next sentence. What is the meaning of this word "promiscuously"?

Pupil. Lying about anyway.

Teacher. "Hannah never went to bed without a pail of water." There is an old proverb that describes her action. What is it?

Pupil. "A stitch in time saves nine."

Teacher. I was thinking of "Prevention is better than cure." But do you think I would improve the sentence by adding on that proverb?

Pupil. Yes.

Teacher. No, I don't think so. What little hint do you get from the next sentence: "An artist friend fitted her out with his cast-off palettes, brushes, and colours, and she daubed away"?

Pupil. That Amy had an artist friend.

Teacher. Don't you get the hint that Amy had no money to buy the things herself, and she got somebody else's cast-offs? It is a very nice way of putting it. But she was not very successful in her painting. What are we told about some of her pictures?

Pupil. They were monstrosities.

Teacher. People would not be very complimentary if they said that. It says that her studies of cattle would have taken prizes at an agricultural show and her nautical studies were not much better. What sort of writing would you call this—reflective, descriptive, or humorous?

Pupil. Humorous.

Teacher. Yes, it is brimful of humour. Now select six phrases in the next paragraph to show if you appreciate the humour.

Class work on their jotters.

Teacher. Now give me six phrases.

Pupil. "The entire family hung in a row."

Pupil. "Wild and crocky."

Pupil. "Ghostly casts."

Pupil. "Unearthly bumping and screaming."

Pupil. "Mysterious doings."

Pupil. "Excavated."

Teacher. What would you say "excavated" is? What do you mean by that word?

Pupil. Digging out.

Teacher. Yes, you excavate for the foundations of buildings. Do you think it is well used here with reference to Amy's foot?

Pupil. Excavating means doing something big.

Teacher. Yes, of course. It is exaggerated. Farther down there is more exaggeration when "ghostly casts" are spoken about. How is it carried on?

Pupil. By the word "haunted."

Teacher. If you look down, you see "other models failing her for a time, she undertook to cast her own pretty foot." Now, was it a pretty foot? How do you think the author was using it?

Pupil. In a mocking sort of way.

Teacher. How do you usually say that?

Pupil. Sarcasm.

Teacher. Yes, sarcasm. It is an abstract noun. Now, do you think the words in this passage are easy or difficult?

Pupil. They are difficult.

Teacher. Yes, I think they are rather difficult. I don't think many of you would write it in that way. I was reading an essay in which there was a phrase about "a permanent moistening of the nether lip." Would it not have been better to say that the person's lip became wet? Again, instead of saying, "Yesterday I had my hair cut," I might say, "Yesterday I visited the establishment of my tonsorial artist." Do you prefer my first sentence to my second?

Pupil. I prefer the second way. It is a nicer way of putting it.

Pupil. I think it depends

Teacher. Yes, I think it depends. Everything depends on circumstances. When are the uses of such big words correct?

Pupil. When you are talking of some big person.

Teacher. Yes, when there is a special purpose. But I don't think you would appreciate a chapter of the Bible written in those big words. I think it would be very much out of place. What sort of person would you expect to use big words?

Pupil. A comedian.

Teacher. Yes, but why?

Pupil. To get people to laugh.

Teacher. Yes, a humorist. Now, there are three things which went to make this passage humorous. They are exaggeration, sarcasm, and vocabulary. We call all these things style. Style is everything. There is a style in writing, and I want you to get it into your writings. But you must learn about it. How, for example, do you learn about fashions?

Pupil. From fashion pictures.

Teacher. Yes, and you learn from books to write well. In other words, you must read good books. Now, how does this writer get her humour?

Pupil. By exaggeration, sarcasm, and vocabulary.

Teacher. Yes. But there is no need for you to use big words. We call a person who does that a pedant.

Now, for your next essay, write something humorous about "My Family," told by the cat.

QUESTIONS AND EXERCISES

1. What is the teacher's aim in this lesson? What difference of emphasis do you notice from that of the previous lesson? Discuss to what extent analysis is in this case necessary as an aid to full enjoyment of the extract.

2. Direct telling is generally less useful in developing appreciation than indirect suggestion or discovery by the pupils. Find one or two examples in the lesson of points of humour told to the class

which might have been elicited from the pupils by questioning. Give the questions you would have used and the answers you would have expected.

3. What are the advantages of requiring the written answers in class as compared with further oral questioning?

4. Cole divides an expository lesson into five steps:

- (a) Motivation.
- (b) Exposition or presentation.
- (c) Illustration.
- (d) Formulation.
- (e) Function.

For fuller account read Cole, *Method and Technique of Teaching*, pp. 65, 72.

Trace these five steps as they apply to this lesson.

5. Discuss the value of the assignment (homework) set by the teacher. Suggest some other type of assignment based directly on the material contained in the lesson, and discuss its usefulness. cp. Reeves, *Standards for High School Teaching*, pp. 181-2).

III

READING—INTERPRETATION

CLASS: Second-year (age 12-13) of 38 pupils (Boys and Girls)

TITLE OF LESSON: "A HIGHLAND ARMY" (*Reading and Study, Book II, pp. 117-18*).

Teacher. Look at the title, "A Highland Army." When was the last occasion a Highland Army was in battle in this country?

Pupil. 1745.

Teacher. Under whose leadership?

Pupil. Prince Charles Edward Stuart.

A pupil reads the first paragraph.

"The Highlanders, while they continued to be a nation living under a peculiar polity, were in one sense better and in another sense worse fitted for military purposes than any other nation in Europe. The individual Celt was morally and physically well qualified for war, and especially for war in so wild and rugged a country as his own. He was intrepid, strong, patient of cold, of hunger, and of fatigue. Up steep crags, and over treacherous morasses, he moved as easily as the French household troops paced along the great road from Versailles to Marli. He was accustomed to the use of weapons and to the sight of blood; he was a fencer; he was a marksman; and before he had ever stood in the ranks, he was already more than half a soldier."

Teacher. Look at this first sentence. What two statements does the author make as to the Celts' ability for war?

Pupil. He says that in one way they are better fitted for war than any other nation, and in another way they are not.

Teacher. To live under a peculiar polity. What is the modern meaning of the word polity?

Pupil. To live a certain way.

Pupil. A way of conducting ourselves.

Teacher. Suppose we talk about Mussolini's policy. What do we mean by that?

Pupil. His policy to rule by a hand of iron—the way he governs his country.

Teacher. Not only that. What else does it mean?

Pupil. His attitude towards other countries.

Teacher. What adjective would describe Mussolini's attitude towards other countries?

Pupil. Pugnacious.

Pupil. Warlike.

Pupil. Harsh or inconsiderate.

Teacher. Yes, warlike or aggressive. Why should you say that the Highlanders did not constitute a nation?

Pupil. The Lowlanders and the Highlanders speak the same language.

Pupil. The Highlanders are just part of a nation.

Teacher. What nation? Is Scotland a nation?

Pupil. No, it is just a country. It has not a king of its own.

Teacher. That would not matter. There are many people living in Europe to-day within their own borders, and each is formed into a nation. There is a word in the first sentence—military—that has to do with war. Give me the derivation of this word military.

Pupil. Miles, a soldier.

Teacher. Give me another English word from miles—another form.

Pupil. Militia.

Teacher. Also militant—a militant policy, the church militant, a militant group within a country. What two statements are made with regard to the capacity of the individual Celt so far as war is concerned?

Pupil. He is well qualified morally and physically.

Teacher. Physically. What do you mean by physically?

Pupil. Strong so far as his body was concerned.

Teacher. Give me a noun like that word meaning your body.

Pupil. Physique.

Teacher. Give me some adjectives that describe the Celt's warlike qualities.

Pupil. Strong, muscular, fleet, bold, courageous, hardy, rugged, stoical.

Teacher. Stoical. What does that mean?

Pupil. To put up with things.

Teacher. It has nothing to do with the physical side of man. It means to be indifferent to circumstances. Like moral, it refers to the state of mind. What is another word meaning the same?

Pupil. Spiritual.

Teacher. Well, what were the Celt's moral or spiritual qualifications for war? Give me some adjectives that describe them.

Pupil. Undaunted, bold, aggressive, intrepid.

Teacher. It is stated that the individual Celt was well qualified for two reasons. What do we mean by the individual Celt?

Pupil. Each man.

Teacher. Yes, give me the opposite of individual.

Pupil. Collective.

Pupil. Combined.

Teacher. What is brought into a community?

Pupil. Communal.

Teacher. What is another word for community?

Pupil. Parish.

Teacher. Intrepid. What is the noun for intrepid?

Pupil. Intrepidity.

Teacher. What is the opposite of intrepid?

Pupil. Timid.

Pupil. Frail.

Teacher. Not necessarily. You can be intrepid and yet be quite frail in body.

Teacher. What is a morass?

Pupil. A marsh, a bog.

Teacher. Where is Versailles?

Pupil. Near Paris.

Teacher. What is Versailles—a house, a shop, a town?

Pupil. A town in France.

Teacher. What is it noted for?

Pupil. Its palace.

Teacher. Who built it?

Pupil. Louis XIV.

Teacher. What do you mean by “before he stood in the ranks he was already half a soldier”?

Pupil. It was his nature always to be fighting.

Pupil. It was in his blood.

Pupil. He had already acquired the arts of warfare.

Teacher. Fighting was in his blood, and he had acquired the art of war by education.

In the next paragraph you get another reason. Read on, E

E reading:

“As the individual Celt was easily turned into a soldier, so a tribe of Celts was easily turned into a battalion of soldiers. All that was necessary was that the military organisation should be conformed to the patriarchal organisation. The Chief must be Colonel; his uncle or his brother must be Major; the tacksmen who formed what may be called the peerage of the little community, must be the Captains; the company of each Captain must consist of those peasants who lived on his land, and whose names, faces, connections, and characters were perfectly known to him; the subaltern officers must be selected among the Duinhe Wassals, proud of the eagle’s feather; the henchman was an excellent orderly; the hereditary piper and his sons formed the band; and the clan became at once a regiment.”

Teacher. What was the other quality the Celts possessed as an organised community that qualified them for war?

Pupil. Discipline.

Pupil. They could easily be turned into a battalion of soldiers.

Teacher. Yes, they could easily be turned into a regiment. Who would be at the head of this?

Pupil. The Chief of the clan.

Teacher. And who would be the officers ?

Pupil. His relatives.

Teacher. What is a subaltern officer ?

Pupil. An officer of a lower rank.

Pupil. A lieutenant.

Teacher. Who were the Duinhe Wassals in the Highlands ?

Pupil. The gentlemen.

Teacher. Who were the people over whom they ruled ?

Pupil. The peasants.

Teacher. Yes, but what do you call the peasants in the Highlands ?

Pupil. The crofters.

Teacher. What is the sentence near the beginning of the paragraph that says the clan could easily be turned into a regiment ?

Pupil. " All that was necessary was that the military organisation should be conformed to the patriarchal organisation."

Teacher. Can you tell me what the first part of the word patriarchal is derived from ?

Pupil. Patriot.

Teacher. But what is the Latin word it is derived from ?

Pupil. *Pater*, a father.

Teacher. What does the word patriarchal mean, if you know it has something to do with father ?

Pupil. Government by a father.

Teacher. What is a patriarchal organisation? Never be afraid of long-winded terms. There is usually a simple meaning behind them.

Pupil. Fatherly.

Pupil. An organisation governed by the father of the clan—the chief of the clan.

Teacher. Yes, a system of government where the Chief rules as a father over his children. You have patriarchal in the Old Testament. Who ruled there as a patriarch?

Pupil. Moses, Abraham.

Teacher. Yes, what is the derivation of patriarchal?

Pupil. *Pater*, a father.

Teacher. It says here the band would be formed by the hereditary piper and his sons. What is the meaning of this word hereditary?

Pupil. Descended by inheritance.

Teacher. What is the meaning of hereditary here?

Pupil. Handed on from father to son right down through the generations.

Teacher. Give me an adjective meaning handed from generation to generation.

Pupil. Descended, perpetual, ancestral.

Teacher. Another word meaning handed on from generation to generation.

Pupil. Bequeathed.

Teacher. No, another word meaning that the son follows in the same work as his father.

Pupil. Traditional.

Teacher. Yes, traditional is a good word here. And here it says that the clan became at once a regiment. When did the clan system die in Scotland ?

Pupil. After the 1745 Rebellion. All the people were losing their farms and sheep, and so the clans were broken up.

Teacher. It was a good day for Scotland when they were broken up, though some people who were rather sentimental thought differently. Now read on a little further.

A pupil reads:

"In such a regiment was found from the first moment that exact order and prompt obedience in which the strength of regular armies consists. Every man, from the highest to the lowest, was in his proper place, and knew that place perfectly. It was not necessary to impress by threats or by punishment on the newly enlisted troops the duty of regarding as their head him whom they had regarded as their head ever since they could remember anything. Every private had from infancy respected his corporal much and his Captain more, and had almost adored his Colonel "

Teacher. What is a regular army ?

Pupil. An army kept standing in peace and war.

Teacher. Give me the opposite of a peace army.

Pupil. An irregular army.

Teacher. We don't use that phrase. What's the other name ?

Pupil. A Territorial Army.

Teacher. What is the difference between the Regular Army and a Territorial Army ?

Pupil. One is reserved for war, and the other stands all the time.

Teacher. Which one stands all the time ?

Pupil. The Regular Army. The Territorials are reserved only for war.

Teacher. Give me another name for Territorial Army.

Pupil. A militia.

Teacher. What is a militia?

Pupil. A reserve army.

Teacher. Can you tell me the name of any country to-day where the militia are fighting the regular army?

Pupil. Spain.

Teacher. What sort of warfare would the militia carry on?

Pupil. Ambushing, guerilla.

Teacher. Spell this word.

Pupil. G-u-e-r-i-l-l-a.

Teacher. Yes, guerilla or guerrilla. You can drop one of the r's if you like. You find it spelt both ways in the Press to-day. What is the derivation of the word?

Pupil. *La guerra*, meaning war.

Teacher. What is the first big quality of the Regular Army?

Pupil. Discipline.

Teacher. Every man in the Highland army, from the highest to the lowest, knew his proper place, and they did not need to use threats. Why?

Pupil. They had too much respect for the Chief.

Teacher. Can you tell me what they called that system in the Middle Ages, when they all respected the Chief?

Pupil. The Feudal System.

Teacher. What do you mean "to impress by threats"? There was no need to impress by threats or punishment

Pupil. To keep telling them.

Pupil. To force it on them.

Pupil. To make an impression.

Pupil. To stress.

Teacher. Yes, stress. Give me a noun.

Pupil. Impression.

Teacher. Give me an adjective meaning a person who can receive impressions.

Pupil. Impressionable.

Teacher. Do you know the Latin word meaning "to believe" ?

Pupil. Credo.

Teacher. Give me an English word from it.

Pupil. Credulous.

Pupil. Credible.

Pupil. Creditary.

Teacher. There is no such word as creditary. What is the difference between a credulous person and a credible story ?

Pupil. A credulous person can believe it easily.

Pupil. Credible means believable.

Teacher. Which of those two words do you apply to persons ?

Pupil. Credulous.

Teacher. Which do you apply to opinions ?

Pupil. Credible.

Teacher. All this discussion came from the word impress. Which is the word meaning impressionable ?

Pupil. Credulous.

Teacher. Well, read on a little.

A pupil reads:

"There was therefore no danger of mutiny. There was as little of desertion. Indeed, the very feelings which most powerfully impel other soldiers to desert kept the Highlander to his standard. If he left it, whither was he to go? All his kinsmen, all his friends, were arrayed around it. To separate himself from it was to separate himself for ever from his family, and to incur all the misery of that very homesickness which, in regular armies, drives so many recruits to abscond at the risk of stripes and of death. When these things are fairly considered, it will not be thought strange that the Highland clans should have occasionally achieved great martial exploits."

Teacher. What is the reason given by the author to account for desertion in regular armies?

Pupil. Homesickness.

Teacher. What do you mean by that?

Pupil. Wearying to get home.

Teacher. Why should there be no homesickness among the Highland army?

Pupil. All their people were at the barracks.

Pupil. All their friends and relations in the clan were with them.

Teacher. Is the statement that there was no danger of desertion in the Highland army strictly true? What happened when Prince Charles Edward Stuart was marching south with the clansmen, and they were laden with plunder?

Pupil. Some of them began to desert.

Teacher. Yes, they had all the booty they wanted, and they decided to go back to their native glens.

What is the meaning of this word martial?

Pupil. Warlike.

Teacher. Give me the derivation.

Pupil. Mars, the god of war.

Teacher. Give me an adjective from Mars.

Pupil. Martial, meaning warlike.

QUESTIONS AND EXERCISES

1. Consider the following possible objectives for a reading lesson, and say to what extent each was realised in this case, making references to points in the teaching:

Which of these objectives seems to have been most fully achieved?

Select one other objective which you would consider most appropriate in teaching this lesson, then outline briefly the methods which you would use to realise it.

- (a) To improve oral reading and pronunciation.
- (b) To extend the pupils' writing and speaking vocabulary.
- (c) To develop the ability in the pupils of getting the general sense of a passage rapidly and accurately.
- (d) To extend the pupils' recognition vocabulary.
- (e) To increase the pupils' enjoyment of reading.
- (f) To train the class in proper habits of reading as a technique.
- (g) To analyse the writer's literary technique with a view to imitation in later composition.

2. What use is made of oral reading in this lesson?

What are the disadvantages of this practice?

Balance the advantages against the disadvantages:

- (a) In this particular lesson;
- (b) In the case of easier reading material;
- (c) In teaching a short poem (Reference : Reeves, *Standards for High School Teaching*, pp. 322-3.)

3. What would be the advantages and disadvantages of requiring pupils to find out the meaning of new words for themselves by using dictionaries? (This might be done co-operatively by dividing the class into groups, each group to be responsible for finding out the meaning of all the new words in one paragraph.)

How would you meet the objection that most educated adults find out the meanings of new words from the context, and therefore pupils at the post-primary stage should do the same?

4. Suppose the aim of the lesson to be the extension of the pupils' reading vocabulary, on what grounds would you criticise the teaching? What improvements would you suggest?

5. Point out more than one example of digression from the main thread of the lesson. In view of the principal objective selected in Question 1, on what grounds would you justify these digressions?

6. Taking into account the aim of the lesson, would you have preferred to use some rather easier material for children of this age (12-13)? Give reasons.

7. It has been suggested by C. Washburne (*Adjusting the School to the Child*, pp. 3-4) that teachers ought to seek a higher standard of efficiency by concentrating on the "minimum essentials" in education, discarding the less essential elements in the course of study.

How would you try to determine the minimum essentials in this lesson, and how would you apply the principle to this case?

8. Make a general criticism of the questions asked by the teacher, and suggest alterations that you would make.

IV

APPRECIATION OF POETRY

CLASS: Third-year (age 13-14) of 26 girls

Teacher. Now you have read quite a lot of poems, such as "The Vagabond," "Sea-fever," "Cargoes," and "Old Ships." And on Armistice Day you read "For the Fallen," "The Soldier," "An Epitaph," and "The Listeners." Now I want you to think about "Sea-fever" and "Cargoes." I am going to read another poem to-day, and I am going to talk about it. But I will explain one word to you before I begin. It is the title of the poem "L'Envoi." Does anyone know what it means?

Pupil. It is French. It has something to do with sending.

Teacher. Does anybody know? Nobody! Well, that at least clears the ground. They say that ignorance is not to be sure of a thing. It is a French word, and it really means Farewell, or Good-bye.

The Teacher reads "L'Envoi" (*A Book of Verse for Boys and Girls*, Oxford University Press, *Part III*).

L'ENVOI

There's a whisper down the field where the year has shot her
yield

And the ricks stand grey to the sun,
Singing:—'Over then, come over, for the bee has quit the
clover

And your English summer's done.'

You have heard the beat of the off-shore wind
And the thresh of the deep-sea rain;
You have heard the song—how long! how long!
Pull out on the trail again !

Ha' done with the Tents of Shem, dear lass,
We've seen the seasons through,
And it's time to turn on the old trail, our own trail, the out
trail,
Pull out, pull out, on the Long Trail—the trail that is always
new.

It's North you may run to the rime-ring'd sun,
Or South to the blind Horn's hate;
Or East all the way into Mississippi Bay,
Or West to the Golden Gate;
Where the blindest bluffs hold good, dear lass,
And the wildest tales are true,
And the men bulk big on the old trail, our own trail, the out
trail,
And life runs large on the Long Trail—the trail that is always
new.

The days are sick and cold, and the skies are grey and old,
And the twice-breathed airs blow damp;
And I'd sell my tired soul for the bucking beam-sea roll
Of a black Bilbao tramp;
With her load-line over her hatch, dear lass,
And a drunken Dago crew,
And her nose held down on the old trail, our own trail, the
out trail,
From Cadiz Bar on the Long Trail—the trail that is always
new.

There be triple ways to take, of the eagle or the snake,
Or the way of a man with a maid;

But the sweetest way to me is a ship's upon the sea

In the heel of the North-East Trade.

Can you hear the crash on her bows, dear lass,

And the drum of the racing screw,

As she ships it green on the old trail, our own trail, the out trail,

As she lifts and 'scends on the Long Trail—the trail that is always new?

See the shaking funnels roar, with the Peter at the fore,

And the fenders grind and heave,

And the derricks clack and grate, as the tackle hooks the crate,

And the fall-rope whines through the sheave;

It's 'Gang-plank up and in', dear lass,

It's 'Hawsers warp her through!'

And it's 'All clear aft' on the old trail, our own trail, the out trail,

We're backing down on the Long Trail—the trail that is always new.

O the mutter overside, where the port-fog holds us tied,

And the sirens hoot their dread!

When foot by foot we creep o'er the hueless, viewless deep,

To the sob of the questing lead.

It's down by the Lower Hope, dear lass,

With the Gunfleet Sands in view,

Till the Mouse swings green on the old trail, our own trail, the out trail,

And the Gull Light lifts on the Long Trail—the trail that is always new.

O the blazing tropic night, when the wake's a welt of light

That holds the hot sky tame,

And the steady fore-foot snores through the planet-powder'd floors

Where the scared whale flukes in flame!

Her plates are scarr'd by the sun, dear lass,
And her ropes are taunt with the dew,
For we're booming down on the old trail, our own trail, the
out trail,
We're sagging south on the Long Trail—the trail that is always
new.

Then home, get her home, where the drunken rollers comb,
And the shouting seas drive by,
And the engines stamp and ring, and the wet bows reel and
swing,
And the Southern Cross rides high!
Yes, the old lost stars wheel back, dear lass,
That blaze on the velvet blue.
They're all old friends on the old trail, our own trail, the out
trail,
They're God's own guides on the Long Trail—the trail that is
always new.

Fly forward, O my heart, from the Foreland to the Start—
We're steaming all too slow,
And it's twenty thousand mile to our little lazy isle
Where the trumpet-orchids blow!
You have heard the call of the off-shore wind
And the voice of the deep-sea rain;
You have heard the song—how long! how long.
Pull out on the trail again!

The Lord knows what we may find, dear lass,
And the deuce knows what we may do—
But we're back once more on the old trail, our own trail, the
out trail,
We're down, hull down on the Long Trail—the trail that is
always new.

RUDYARD KIPLING.

Teacher. Now, I have read that poem, and I want to ask you some questions about it. Poems mean different things to different people. I know perfectly well what this poem means to me, but I should like to know what it means to you. Now, what is it about?

Pupil. A ship on the sea.

Pupil. A sailor telling a girl of the life at sea that he knows.

Teacher. What do you say, Zena?

Pupil. The poem gives different instances of happiness on the sea.

Teacher. It really tells of a rough sailor man's longing for the sea. How many of you really like the sea?

Show of hands.

Teacher. Well, that is very nice. Those of you who like the sea will be able to sympathise with the man who is speaking here. Look at the opening of the poem. What does he mean by:

“ There's a whisper down the field where the year has shot her
yield

And the ricks stand grey to the sun,
Singing:—‘ Over then, come over, for the bee has quit the
clover

And your English summer's done. ’ ” ?

Pupil. He says that the summer is over and he is glad, for he enjoys the winter on the sea.

Teacher. Yes, he feels that he would like to have a change and get back to sea. Almost everybody has felt the urge at some time or other to be up and doing. Most of you have had that sort of feeling at the end of the term. But what is it that you want most? Is it a change from school?

Pupil. I want to be free.

Teacher. To be free from lessons. Well, I think that is very natural. When the end of the term comes round you don't want to be in school here. Where do you want to be?

Pupil. In the country.

Teacher. Now, about this man. Do you think he is very keen about the sea, or just half-hearted?

Pupil. Very keen.

Teacher. What makes you think so? Tell me the words that suggest it.

Pupil. "Pull out on the trail again!"

Teacher. Yes, that line tells you that he loves the sea, and was not a land-lubber. But what is it about this life at sea that attracts him most?

Pupil. It is always new to him.

Teacher. Yes, "the ship's upon the sea, in the heel of the North-East Trade." The sea was always new and full of adventure to him. Now I am going to give you some things to find out. He says there were triple ways to take, but he knew the best way. When I was reading this poem, what struck you most?

Pupil. The way the words seemed to describe it.

Pupil. The words were heavy.

Teacher. Yes, give me some heavy words.

Pupil. "Can you hear the crash on her bows."

Pupil. "The drum of the racing screw."

Teacher. Yes, all the things that make you think of a ship.

Pupil. "The clack and grate of the derrick."

Teacher. Yes. Now go back and see what else we can discover. What is the refrain of the poem?

Pupil. The bit that is repeated.

Teacher. Yes—"how long! how long." In the first verse he is letting you know of this urge to go, and it is the call of the sea that he loves. That is the first idea that comes into your mind. He says, let us leave this comfortable place and go to sea, and he gives you a few pictures of what you might see if you were a sailor man. He is giving you a picture of this place here.

The Teacher draws an outline of America on the board, and the Pupil points to places mentioned in verse 3.

"It's North you may run to the rime-ring'd sun,
Or South to the blind Horn's hate;
Or East all the way into Mississippi Bay,
Or West to the Golden Gate."

Teacher. It is wonderful how fascinating we find the names of places. If you got the chance to sail away on a boat from Leith, which one would you choose?

Pupil. The Golden Gate.

Teacher. Yes, I agree with you. I have always wanted to go there. I think names have a magic about them. Where would you like to go?

Pupil. To the North.

Teacher. Yes, it would be fascinating there, too. Perhaps you remember the lady who came here and gave a lecture, which she called "The Land of the Rime-ring'd Sun." She took her image from this verse. Yes, it is rather remarkable how we are attracted to a place because the name sounds good. Is there any other place you would like to go to because of its name?

Pupil. Switzerland.

Teacher. Does that sound good to you? Any others?

Pupil. Devon and Cornwall.

Pupil. Scandinavia.

Teacher. Well, I once knew a little boy to whom the Scriptures had been well taught, and he was once found in the nursery all by himself shouting the sound of the word that had fascinated him. And what do you think it was? Mesopotamia! And I once knew an old nurse who had brought up a large family—there were seven children in it—and who used to sit dandling the children on her knee to the sound of a Latin word, from Virgil. She had heard it, but did not know what it meant. It is an odd thing how words and names fascinate us. Now look at the next verse. It says “The days are sick and cold, and the skies are grey and old.” What does that tell us?

Pupil. It is foggy and dark.

Teacher. Yes. You know India very well. Have you ever compared some foggy days in Edinburgh with a day in Bombay? What is it usually like in Bombay?

Pupil. The sea is very blue and the sun is shining.

Teacher. Then he goes on to describe the noise of the steamer starting. It is a very noisy picture, but it is much quieter when he says:

“O the mutter overside, when the port-fog holds us tied
And the sirens hoot their dread!”

Pupil. It is a very foggy day, and they have to take great care.

Teacher. Yes, when it is foggy ships at sea have to take great care. You have heard the warnings being sent out over the wireless to sailor men. Sheila, you live down by the sea at Gullane, and you must have seen the sea in all its ugly moods. The sailor here tells you that they have to look out for a lighthouse light or a buoy. If they miss the lights they run on to

the rocks. Often on the wireless you hear the man telling sailors where to be careful. The other night I heard a man telling seamen that the lights were out to the left of Lochboisdale Harbour, where I once had to wait for two hours. These things are very important to a sailor. Now he goes on to paint this picture of the tropics "that holds the hot sky tame." And "the wake's a welt of light." What is the wake?

Pupil. The back.

Teacher. If you have ever been in the stern of a steamer and watched the foam at the back of the ship, that is the wake. A welt is a sort of binding, or hem, such as you have on your books there. He tells you that the lights are so powerful in the tropical night that they are reflected, and every time the fish jump out of the water they are seen shining like a phosphorescent light. Now you will see that these two verses move at a different pace.

Pupil. They move slowly.

Teacher. Yes, and suddenly they move very quickly. What is it that now comes in sight as they look up to the sky, which is the sailors' guide?

Pupil. Stars.

Teacher. And which particular one?

Pupil. The Southern Cross.

Teacher. Yes. When you look out in Edinburgh at night when the moon is not shining too brightly, what constellation do you see.

Pupil. The Plough.

Teacher. But if you have a brother who looks out at night in Sydney or Melbourne, what does he see?

Pupil. The Southern Cross.

Teacher. Yes. Now he says "And it's twenty thousand mile to our little lazy isle, where the trumpet-orchids blow!" What sort of a picture is that?

Pupil. A little lazy island, blazing with flowers.

Teacher. But what sort of flowers would they be? The kind that you would find in a garden in Edinburgh?

Pupil. No, tropical.

Teacher. Well, give me an example. You, Margaret, come from East Africa. What do they mean by tropical?

Pupil. Giant flowers.

Teacher. Which sea do you think this "twenty thousand mile" covers?

Pupil. The Mediterranean.

Teacher. No; hardly that, I think.

Pupil. The Pacific.

Pupil. The Indian Ocean.

Teacher. Yes, somewhere about there. I think you can put your island where you like.

Teacher. Now look at the last verse. Is that the sort of way we speak in a school for young ladies? Who is speaking now?

Pupil. A country sailor.

Teacher. That is a funny way to speak of a sailor.

Pupil. A rough sailor man.

Teacher. Who is he talking to?

Pupil. His girl.

Teacher. Give me a better answer than that. Do you mean his daughter or his sweetheart?

Pupil. His sweetheart.

Pupil. It might be his wife.

Pupil. Or his ship.

Teacher. Well, we have at least a very wide choice. It might be his wife, or his daughter, or his sweetheart, perhaps his sister, or his ship. But I am glad that you have all your own views. Poetry is no use unless you take something out of it. I have certainly my own views on what it all means. Well, at all events, he speaks to her for a very long time. Do you think she is going with him.

Pupil. No.

Teacher. Did this person, whoever it is, go with him to the little lazy isle?

Pupil. It does not tell you.

Teacher. Now I want you to find out six things: The Tents of Shem (you will get that from the Bible); triple ways to take; derricks (look up that word in your dictionary); silent; questing lead (no, you can leave that one out—questing means searching, and they used a lead to find their depth); tropic; and the shape of the stars in the Southern Cross and the shape of the stars in the Plough (you have got to know what both constellations look like). And the other thing I want you to find out is, what are the Trade Winds? Well, you can compare this poem with "Sea Fever," and tell me if it is anything like it. Now shut your books for a moment, and see if there is anybody who can tell me any of the lines or phrases in the poem.

Pupil. "It's North you may run to the rime-ring'd sun."

Pupil. "Pull out, pull out, on the Long Trail—the trail that is always new."

Pupil. "How long! how long."

Pupil. "The blind Horn's hate."

Pupil. "West to the Golden Gate."

Pupil. "East all the way to Mississippi Bay."

Teacher. Now, how is it that you can remember all that?

Pupil. The rhythm of it.

Teacher. Yes, the sound of it—"East all the way to Mississippi Bay."

Pupil. You have pictures.

Teacher. Yes, and a lot of proper names. They are sprinkled over the poem. And there is another thing—rhyme. What the poet has to try to do is to put into words the feelings that everybody has. There are a lot of people who would have horrible feelings if they were to step on to a buccaneering tramp-steamer, but do you think they could not enjoy this poem?

Pupil. They would enjoy it.

Teacher. Yes, we can all share the poet's picture. Now and again everybody wants to get away from their everyday surroundings to have their freedom. The school teacher, for example, likes to think at the end of the summer term that she can get away to the mountains or the country, and be free from her usual surroundings.

QUESTIONS AND EXERCISES

1. How was the principle of apperception applied in introducing this lesson? Would a longer introduction before reading the poem have been an improvement or not? Why?

2. Give several examples from the report to show how the teacher made use of: (a) the general experience of the class; (b) the particular experience of individual pupils; (c) her own experience. Compare the relative values of these three types of reference.

3. P. 44, ll 4-7. On what grounds do you approve or disapprove of the teacher's leaving the interpretation of this point vague?

4. What were the advantages of omitting to explain the meaning of certain phrases—"tents of Shem," etc.—and asking the class to look up the meaning out of class? P. 44, ll. 15-26.

5. What was the value of calling for odd lines remembered spontaneously (p. 44, l. 27—p. 45, l. 2)? Would you have set a definite part of the poem to be memorised? What would be the advantages and disadvantages of doing so?

6. Not a single figure of speech was identified by name in the whole lesson, and rhyme and rhythm were just mentioned in the last few minutes. On what grounds would you justify these omissions from a poetry lesson?

7. (a) If you were to devote another period to the study of this poem, what would you make your main objective? Give a general outline of your method of treatment.

(b) Would it be desirable to spend another whole period on this poem? Give your reasons for or against.

V GRAMMAR

CLASS: Third-year (age 13-14) of 26 boys and girls

Teacher. This morning we are going to do a lesson in grammar. Now, what exactly do we mean by grammar?

Pupil. The ordinary rules for correct speech and writing.

Pupil. Proper speech and proper writing.

Teacher. Yes, grammar gives us all the rules for correct speech and correct writing. It is the way in which we express our thoughts. If I wish to express my thoughts and ideas to you, what do I use? What do I do?

Pupil. You use speech.

Teacher. Yes, speech in the form of words and sentences. Words are the bricks with which we make our sentences. We use words in a particular way, so that the sentence becomes complete, and we have only a sentence when the sense is clear and complete. That is what we really mean by a sentence. Now, can you tell me the various types of sentence I might use?

Pupil. The simple sentence, the complex, and the compound sentence.

Teacher. Quite right. But how many have you mentioned?

Pupil. Three.

Teacher. What do you mean by a simple sentence?

Pupil. A sentence where there is only one subject and one predicate.

Teacher. What do you mean by the subject?

Pupil. The thing that is spoken about.

Teacher. And the predicate?

Pupil. The predicate tells us what is said about the subject.

Teacher. Very well. I will write down some sentences made up on the spur of the moment. Don't you do anything, but get your books ready.

Teacher writes on blackboard:

"Our friends went to the station."

"The station was two miles distant."

"They expected to meet some friends."

"These friends were arriving late."

"They had never been in that district before."

Teacher. Now, that might be an account that someone was writing about some friends. But would you like to read an account written in that fashion?

Pupil. No, it is scrappy. The sentences are too short.

Teacher. I wonder what you would say if you read a story like that. You would say it was tiring. Do you know another word for tiring?

Pupil. Boring.

Teacher. No, there is another word we use when a person talks in the same tone or fashion.

Pupil. Monotonous.

Teacher. Quite right. But I think that grammar's first rule should be to teach us to make our sentences properly. The sentences on the board are monotonous, but I might take the five and make two. Or I might take the lot and make one. We will take them and join them up. What is the most common joiner in speech?

Pupil. "And" and "but."

Teacher. Yes, but I think they are both very much over-worked. In joining up this sentence I think we should try to avoid the use of "and" and "but." There are other ways we can use. You might drop one word, or you might change the order, but I want one complete sentence giving me all the facts. Now try it on your jotters, doing it in the best possible way.

After the pupils have worked for a few minutes at their jotters, the teacher asks a girl to read what she has written.

Pupil. "Our friends went to the station, which was two miles distant, where they expected to meet some friends, who were arriving late, as they had never been in that district before."

Teacher. That is very well read. Did anybody hear the word "and" used?

Pupil. No.

Teacher. Well, let us hear what somebody else has written.

Pupil. "Our friends went to the station, which was two miles distant, where they expected some friends, who were arriving late, as they had never been in that district before."

Teacher. There is just one place where there is just a little bit of completion wanted. We shall see that when we come to analyse it, or break it up. You know what analysis means?

Pupil. Simplifying the sentence.

Teacher. No, it means breaking up.

Writes on board:

Ana-lysis = placing apart.

Teacher. The opposite of that is synthesis.

Writes on board:

Syn-thesis = placing together.

Teacher. Now, people who write every day polish and re-polish their sentences to see that they get the very best form of expression. If this here is a sentence, there must be something on which the whole sentence is founded.

Pupil. The principal clause.

Teacher. Yes, so what do you make the foundation of your sentence?

Pupil. "Our friends went to the station."

Teacher. That is right. And what have we joined on to it?

Pupil. "Which."

Teacher. What do you call that grammatically?

Pupil. A relative pronoun.

Teacher. Yes, that is the name. It is called relative because it relates, and a pronoun goes in front of a noun.

Teacher. Now look at this one. What have we turned it into?

Pupil. An adjective clause.

Teacher. Yes, an adjective clause must do the same function as an adjective. That is an adjective clause qualifying "station." We can now turn this clause into a phrase: "Our friends went to the station two miles distant, where they expected to meet some friends." I think "where" is a better joiner than "and," which is rather weak and loose. Now look at the next bit. What information do we get from it?

Pupil. The reason why they are arriving late.

Teacher. Do you think so? I would not say that.

Pupil. The reason why the people went to the station.

Teacher. I think that is why they went to the station. Now look at it again. "Our friends went to the station two miles

distant, where they expected to meet some friends, who were arriving late as they had never been in the district before." Is there not a chance of confusing our friends, the people who went to the station, with the people who were arriving? We might avoid that confusion by putting in "the latter," instead of the last "they." Well, what is the best way to express yourself? A series of short sentences, or that way?

Pupil. That way.

Teacher. Yes, I want you to write that way and so get balance into your writing of sentences. Let us illustrate how we can break up the sentence into clauses by drawing a tree. (Draws on the blackboard.) Its body—"Our friends went to the station two miles distant"—is the principal clause, and here are the branches coming out from the main tree. What is the first branch?

Pupil. "Where they expected to meet some friends."

Teacher. That is right. Is that coming out from the principal clause?

Pupil. Yes.

Teacher. And it is an adjective clause. Where is the next one?

Pupil. "Who were arriving late."

Teacher. And where does it come from?

Pupil. From the adjective one.

Teacher. Yes, that is right. It comes from the adjective clause, not from the main one, or principal one.

Teacher. Well, here are some more sentences.

Writes on board:

"The boy sat on the wall."

"He was watching his sister."

"She was playing with her doll."

"Her younger brother was amusing himself with his bricks."

"He was building a castle with them."

Teacher. This time I want you to join up these sentences, remembering that what might be a clause may be expressed as a phrase. A great many of these sentences I have written down begin with a present participle or a past participle. Here is another example: "He opened the door. He entered the room, and took his place at the table." There are three different things. Express them in English in better language.

Pupil. "He opened the door, and entered the room, and took his place at the table."

Teacher. Well, what is the fault with that? Exactly what we have been saying here this morning.

Pupil. The use of the word "and."

Teacher. Yes, somebody else try.

Pupil. "Opening the door, he entered the room, to take his place at the table."

Teacher. Well, take these sentences and join them up, using a participial phrase for an opening. More errors occur from the faulty use of participles than anything else. Here is an example: "Turning the corner, the house stood in front of us." You know what that means. What you really mean is that you turned the corner and saw the house. From my sentence what would you gather?

Pupil. That the house came round the corner.

Teacher. Yes. Well now, join up the sentences I have written down.

After a few minutes a girl is asked to read what she has written.

Pupil. "Sitting on the wall, the boy watched his sister playing with her doll, while her younger brother amused himself with his bricks."

Teacher. Would you say it was good, fair, or very good? I would say it was very good. But what about the castle?

Pupil. "Sitting on the wall, the boy watched his sister playing with her doll, while her younger brother amused himself with his bricks, with which he was building a castle."

Teacher. I would say "seated" at the start of the sentence, and say "building a castle with bricks with which he was amusing himself."

QUESTIONS AND EXERCISES

1. Compare the value of this lesson with one devoted mainly to the analysis of complex sentences, assuming that the aim of the teacher is to develop habits of correct writing.

2. Discuss the revision questions on p. 47 as an introduction to the rest of the lesson. Suggest an alternative way of introducing the lesson.

3. Compare the method of having the pupils work the exercises on paper with that of having oral suggestions for joining the sentences. The criticism might be made that the teacher was unable to correct most of the pupils' attempts, with the consequent danger of wrong habits being formed. How would you meet this criticism? Would such a criticism be justified in the case of similar desk work in algebra or arithmetic?

4. Assuming that this lesson has established its general principle in the minds of the pupils, by which of the following methods would you prefer to give the necessary additional practice in applying it at the next period? What principles of drill teaching are involved in your choice?

(a) Give a number of similar exercises in joining simple sentences into complex ones, for pupils to work on paper in class.

(b) Set an ordinary composition topic, reminding the pupils of the need to use complex sentences, and mark the composition largely on the basis of the pupils' successful use of such sentences.

(c) Give exercises in joining simple sentences, but make the standard more difficult by requiring pupils to begin sentences in different ways, e.g. with "although," "when," "since," a participial phrase, etc. (cp. teacher's second example, p. 52, l. 21).

5. What was the value of the illustration of the tree and its branches in this lesson?

VI COMPOSITION

CLASS: First-year (age 11-12) of 30 boys

Teacher. We are going to do an essay on "English Blood Sports." I have deliberately chosen that subject because some of you may be confronted with a lack of ideas regarding it. In any case, in an examination you have a choice of four subjects, and I want you to be able to take up any one of them. Now, what is absolutely essential in an essay?

Pupil. An introduction and an end.

Teacher. It would not be an essay if you had not an introduction and a conclusion.

Pupil. You need to have at least two paragraphs.

Teacher. Yes, you need some paragraphs. Why?

Pupil. You need to have paragraphs to show that you are dealing with different topics.

Teacher. Yes, you need to have your paragraphs to deal with your different points. If you wrote an essay on the life of Nelson and started by saying "Nelson during his boyhood knew no fear," then went on in the second paragraph to say that Nelson died in 1805, and then in your conclusion mentioned when he was born, you would be going in the wrong order. The idea of paragraphs is to divide your essay into logical sequence and develop your ideas. In this essay we will possibly have three paragraphs. Now, on this side of the black-board we shall put a list of the ideas for it, which I want you to give me. When you have any ideas for an essay you ought

to take a sheet of paper and jot them down. For example, when I saw the title of this essay, I thought of bull-fighting. It is not connected with English blood sports, but it is always an idea. Now give me some of your ideas on the subject.

Teacher writes on board as pupils make suggestions.

Pupil. Fox-hunting.

Pupil. Stag-hunting.

Pupil. Otter-hunting.

Pupil. Deer-hunting.

Pupil. Hawking.

Pupil. Cock-fighting.

Pupil. Hare-hunting.

Pupil. Badger-hunting.

Pupil. Rabbit-hunting.

Pupil. Stoat-hunting.

Pupil. Mole-hunting.

Teacher. Well, well, mole-hunting an English blood sport!

Pupil. Rat-hunting.

Pupil. Weasel-hunting.

Teacher. You have a good number of animals and birds that are hunted. That list will do for the animals. But we shall have to get other ideas. These are the favourite sports of the English country squire. We need more for an essay. Now, what do we need at the start?

Pupil. A beginning, an introduction.

Teacher. Yes, an introduction. What will it be? It might be a description of some particular sport or—

Pupil. A description of the most popular sport.

Teacher. No, the second paragraph would be the description of the various kinds of sport. The first paragraph, the introduction, could deal with their popularity. Now, what would the third paragraph be?

Pupil. A description of one particular sport.

Teacher. This is going to be a long essay. For a great number of years, I suppose you know, there has been a great controversy as to whether blood sports should be permitted. So your essay would hardly be complete without some reference to that point. So what shall we say?

Pupil. Give your views on the subject.

Teacher. Yes, it will be a long essay. What will you do after that?

Pupil. Find out your conclusions.

Teacher. Now, let us get some ideas for the third paragraph, a description of one or other of the various sports. What do you think offers most scope?

Pupil. Fox-hunting.

Teacher. Yes, I agree with you. Has anyone any ideas about fox-hunting?

Pupil. Yes, hounds and horses.

Pupil. The nature of the country over which the hunt is.

Teacher. The nature of the country. Well, what about it?

Pupil. The trees and the hedges.

Teacher. Yes, how the hedges looked as the hunt went over the country. Would they be broken? What season would it be?

Pupil. Winter.

Teacher. Well, we have the wintry aspect of the countryside—hedges, trees, copses. Give me other ideas for this third paragraph, which deals with a description of the sport.

Pupil. You would need plenty of ground for the horses to follow the hounds.

Teacher. Yes, you mean open country.

Pupil. The huntsmen, their clothes.

Teacher. Yes, what about them?

Pupil. The huntsmen wear red coats.

Teacher. What else?

Pupil. The horns.

Teacher. Now, that will do for the third paragraph. Let us deal with the fourth. What did I call that subject?

Pupil. The controversy about blood sports.

Teacher. Yes, some ideas about that.

Pupil. The enjoyment of the hunters.

Teacher. What do you call them, the people that go out on the hunt?

Pupil. Hunters, huntsmen.

Teacher. There is another word meaning the people that join the hunt. Nobody know it? Well, it is "meet." What else?

Pupil. The death of the quarry.

Teacher. What do you mean by that?

Pupil. The fox torn to pieces by the hounds.

Teacher. But how would you develop that idea?

Pupil. By saying there would be no suffering if the fox was shot. That would be instantaneous death.

Teacher. Yes, that is a good point. Now give me the opposite view, so that we can develop the paragraph.

Pupil. The anguish suffered by the fox.

Teacher. Any other ideas?

Pupil. The excitement of the hounds.

Teacher. Well, this boy mentioned that the fox was torn to pieces by the hounds and that death was not instantaneous. What is the other idea that might follow there?

Pupil. That the fox could be killed in other ways.

Teacher. How could that be brought about?

Pupil. By shooting.

Pupil. By trapping.

Pupil. By poisoning.

Teacher. Yes. Well, these two points can go in opposition in this fourth paragraph, and I think we shall have enough. An essay has been said to be the same as going into your bath. You spoil your enjoyment if you spend twenty minutes at the side wondering if it is cold, and then come out at the end of two minutes. The best thing is to jump right in. So it is with your essay—you should plunge right into your subject. Your introduction should consist of one or two lines, your other paragraphs should contain the meat, and your conclusion should sum up. Do not use any word that occurs in the title until your conclusion. By following that rule you will round off your conclusion suitably. Now, what must we have for an essay?

Pupil. Paragraphs.

Teacher. Yes, and if you can't start your essay right away, jot down your ideas on a piece of paper. What are the things to avoid in essay-writing?

Pupil. Avoid starting a sentence with the word "and" or "but."

Pupil. Don't use the term "to get."

Teacher. Yes, most of you use "to get" in the wrong sense. What it does mean is "to receive." Most of you use it in the meaning of "to become." What else should you avoid using?

Pupil. "Nice."

Teacher. Yes, and if you want to use something for "but" in a sentence, what do you put in?

Pupil. "However."

Teacher. But where do you put it?

Pupil. In the middle of a sentence somewhere.

Teacher. Yes, if you put it in at the beginning it breaks the smoothness of your sentence.

Pupil. You shouldn't use the word "terrible."

Teacher. Yes, and what else do you need?

Pupil. Punctuation. The comma and the full stop.

Teacher. And what else?

Pupil. The semi-colon.

Teacher. Yes, and there is another point. Don't start your sentences in the same way: vary your words. Now we will begin this essay. What is it about?

Pupil. English blood sports.

Teacher. Yes, but I don't want any of those words used till the end. Now give me an idea for the beginning.

Pupil. "Fox-hunting in England is the equivalent of bull-fighting in Spain."

Pupil. "Hunting is perhaps the most popular recreation among the landed classes in England."

Teacher. Yes, good. But I must have my own idea of bull-fighting used. Before we go on we must know if the landed classes are the only people who go in for hunting.

Pupil. No, all classes go in for it.

Teacher. Yes, in different forms. You have hound-trailing, which farmers go in for. The dogs used are mostly lurchers which are being trained for hare-hunting. Now give me another sentence.

Pupil. "As bull-fighting is the foremost sport in Spain, so fox-hunting is in England."

Teacher. Yes, but before you go any farther, we have the phrase "In England" repeated. We must avoid that sort of thing. Give me another phrase.

Pupil. "In this country," "here," "among Englishmen," "at home."

Teacher. Yes, we will put in "here" just now. Give me another sentence to continue.

Pupil. "But other classes also indulge in similar sports."

Teacher. Yes, we will take that as an introduction and make it perfect before we go any farther. How many of you like the word "here"?

Pupil. Make it "in this country."

Teacher. Yes, that is a good idea. We will change it and leave that as an introduction. What is the next paragraph?

Pupil. A description of the various kinds of sport.

Teacher. Here you have a list of the various kinds of hunting. Give me the most important ones.

Pupil. Deer, stag, fox, hare, otter.

Teacher. Well, these are the most important forms of hunting. Give me the first sentence for this paragraph. In the first sentence you make a statement and then go on to develop it in the next sentence. Give me a sentence mentioning the other types of hunting carried on.

Pupil. " Stag-, otter-, and hare-hunting, however——"

Teacher. The " however " does not sound very well. I think we will take it out and say " Stag-, otter-, and hare-hunting vie with fox-hunting." Go on.

Pupil. " In the minds of Englishmen who engage——"

Teacher. Give me another word for " engage."

Pupil. " Participate."

Teacher. I think " engage " is best, but we can change it later. Now we have: " Stag-, otter-, and hare-hunting vie with fox-hunting in the minds of Englishmen who engage (or participate) in mild forms of sport." What about this word " mild " ?

Pupil. Make it " such."

Pupil. Make it " such forms of amusement."

Pupil. Make it " such forms of recreation."

Pupil. Make it " such a pastime."

Teacher. There is another good word, derived from the French *poursuivre*.

Pupil. Pursuit.

Teacher. Yes, that's the word. Let us carry on with a description of one of these particular sports. What about expressing your own particular opinion ?

Pupil. "Fox-hunting meets with my approval——"

Teacher. That's rather a pompous way of describing it.

Pupil. "The atmosphere at a meet is rather exciting."

Teacher. Yes, and that is why you like it. Come on, express your liking for fox-hunting and the reasons for liking it.

Pupil. "To me, however, who revels in excitement——"

Teacher. Yes, but how do you describe the red coats of the huntsmen, and the dogs with the brown spots on them?

Pupil. "And colourful scenes of the meet, fox-hunting comes first among——"

Teacher. Well?

Pupil. "Reigns supreme."

Teacher. Too pompous.

Pupil. "Comes before them all."

Teacher. Make it: "To me, however, who revel in excitement and the colourful scenes of the meet, fox-hunting comes before them all."

ON THE BLACKBOARD

Bull-fight

fox

stag

otter

deer

hawking

cock-fighting

hare

badger

rabbit

English Blood Sports

1. Introduction—popularity.
2. Description of various kinds.
3. Description of one particular sport.
4. Views on subject.

Hunting is perhaps the most popular recreation among the landed classes of this country. As bull-fighting is the foremost sport in Spain, so fox-hunting is here,

stoat
mole-hunting
rat-hunting
weasel-hunting

Fox-hunting

hounds and horns
winter aspect of
countryside
hedges, copses
open country
huntsmen's calls
red
horns

but the other classes also indulge in similar sports.

Stag-, otter-, and hare-hunting vie with fox-hunting in the minds of Englishmen who participate in such pursuits. To me, engage

however, who revel in the bustle and excitement and colourful scene of the "meet," fox-hunting comes before them all.

Controversy

Enjoyment of the
followers
Death of quarry—
torn to pieces
not instantaneous
death
anguish of animal
excitement of the
hounds
other ways of
killing fox—
shooting, trap-
ping, poisoning

QUESTIONS AND EXERCISES

1. At the end of the period only four sentences had been composed. What light does this fact throw on the teacher's main object in taking this type of lesson?

What section, if any, would you have preferred to omit from your lesson plan? Give reasons.

2. How do the aims of this lesson differ from those of an oral composition period in which pupils deliver previously prepared speeches? (Ref.: Reeves, *Standards for High School Teaching*, pp. 317-19; Colvin, *An Introduction to High School Teaching*, pp. 218-20.)

Compare the relative values of the two types of lesson.

3. A danger of this type of lesson is that a few quick pupils tend to do all the work. How would you avoid this? To what extent is this particular lesson open to the criticism that the teacher does all the work?

4. From the point of view of improving the pupils' writing of English, would it have been more advantageous for the teacher to present to the class an essay by a good writer on the same subject, and then spend the period analysing with the pupils the good points of composition in the model essay? Give reasons.

5. The following is a list of advantages which might be claimed for this type of composition lesson. In each case consider whether it is a real advantage and whether there is any corresponding disadvantage.

(a) Errors can be corrected on the spot without the usual delay of a week for compositions to be corrected and handed back. (For example, p. 62, l. 6, "To me who revels," could have been corrected and explained at once.)

(b) The whole class gets the benefit of such corrections.

(c) The pupils' writing vocabulary is enlarged in a natural way by the suggestion of alternative words by other pupils, and more practice is given in the selection of the most suitable.

(d) More practice is given in the selection of the most relevant ideas out of a much larger number than any one pupil would have.

(e) The teaching can be concentrated on the actual means of expression, where ordinarily the pupil has to struggle with both ideas and their expression.

(f) Special attention can be given to the arrangement of ideas and paragraphing.

(g) It eases the teacher's load of correction.

(h) It gives the pupils some practice in oral expression.

(i) It encourages co-operative work in the class.

6. Is this type of lesson more valuable as a very occasional variation from ordinary written composition, or should it have a regular place (e.g. once every four weeks) in composition teaching? Give reasons.

VII HISTORY

CLASS: First-year (age 11-12) of 39 boys

TITLE OF LESSON: ENGLISH VILLAGE LIFE IN THE
SEVENTEENTH CENTURY

Teacher. Well, to-day I am going to talk about the life of the people in Britain during the seventeenth century. I am not going to talk about quarrels and strife between kings and Parliament and fighting and warfare, though there was a lot of trouble during that time. You know how Charles I quarrelled with his Parliament. Why did he quarrel with them?

Pupil. For taking bribes.

Teacher. Yes, but there was another reason.

Pupil. Religion.

Teacher. Yes, religion.

Now we are going to talk about the life of the ordinary person during the seventeenth century. There are two kinds of people in Britain at every time. There are people like you and me who live in the town, and people who live in the country. I wish to begin by speaking about the people who live in the country. Why do I do that?

Pupil. The people who lived in the country were more important, because at that time they raised the crops which gave the people food.

Pupil. Most of the people at that time were farmers and peasants.

Teacher. Yes, that is the reason. To-day, if we were discussing this question, we would very likely start with the——

Pupil. People who live in the towns.

Teacher. Yes, in the country during the seventeenth century there was the squire of the village and the ordinary peasant working away on his little farm. We are going to talk about the squire, who was the most important person in the village. The other day we were talking about his life at school. Where did he get his first education?

Pupil. From the local parson.

Teacher. Yes, probably. Then he went to school—probably to a boarding-school, not a school like this. What did he learn there, mostly?

Pupil. Latin.

Teacher. Yes, because most things were written in Latin at that time. Then afterwards he went to the University. What did he learn there?

Pupil. Doctoring.

Teacher. No, he learned something else. What was it?

Pupil. He learned to be a lawyer, because he knew he would have something to do with law.

Teacher. Yes, he needed to know something about the law, because when his father died and he became the head of his estate, he would have to uphold the law. But what would his first job be?

Pupil. He would represent his people in Parliament.

Teacher. Yes, but what else did he do?

Pupil. He sat at the top of the court.

Teacher. Yes, he took his place behind the president of the local law court and had to see that justice was done. He

would have to know something about the administration of the law. Now, remember this man was not very old when he took over these jobs. He would go to the University when he was about fourteen, very much younger than people go nowadays. After his time at the University he would go back to the village and succeed when his father died. This village would either have a clump of houses built round about it or its houses just in a row along the street, but somewhere there would be the squire's house. In the seventeenth century a house of that sort was not like any ordinary dwelling-house to-day. Can you remember what it was like?

Pupil. Yes, it was in the shape of an H.

Teacher draws plan, in form of a figure H, on blackboard.

Teacher. But how am I looking at it?

Pupil. From above.

Teacher. Yes, I am looking at it from above. There would probably be a wall of some sort round about here. What would it be made of?

Pupil. Of wood.

Teacher. Yes, something like that—a fence made of wood or a palisade. I don't want you to mix this up with the house of a farmer, which we will hear about later. In the squire's house you would enter through this door and find yourself in a great hall. That hall was very different from what you see in your house or what I see in mine. It was the main room where the people sat and ate and entertained their friends, and here, just beside it, would be the hall kitchen, where the servants did their work and did their cooking and had their own meals when their work was over. In between, at the end of each room, there was an enormous chimney. The two chimneys were always next to each other, and were enormous things, and you could roast an ox on the fire. The people sat up to the corners of these great fires, because in such houses

you had to be near the fire to keep warm. The houses were very draughty, and as there were fires only at one end of such enormous rooms it was pretty chilly having your dinner in one of them towards the end of the seventeenth century. What is it that makes the rooms in our houses warmer?

Pupil. Coal.

Teacher. No, something more than that.

Pupil. We have carpets.

Teacher. Yes, we have carpets to put on the floors of our rooms. They had nothing very much in the way of carpets in the seventeenth century. Probably you would find rush mats if you were lucky. The floors were all made of stone, and there was very little else, apart from tapestries, to keep the room warm, so you can imagine it was not very comfortable in those days. Neither, as we said before, had the squire a very comfortable time as a boy at school. What did he have to do that we would not like to do to-day?

Pupil. Wash with cold water.

Teacher. Yes, and he had to get up about five o'clock in the morning. What else did he have to do during his schooldays?

Pupil. Scrub the floors.

Teacher. And what about the discipline?

Pupil. They had the birch rod.

Teacher. Yes, they had the birch rod, which I can tell you was very much sorer than the strap. I can also tell you that the boy then had not such a pleasant time as some of you who live in Stenhouse Avenue West, or some place in that quarter. Well, to get back to this chimney, what did you find there?

Pupil. Hooks.

Teacher. Hooks, possibly, but what else? What are the things that would be left hanging there for a long time?

Pupil. Bits of hams.

Teacher. But why were they hanging in the chimney ?

Pupil. To smoke the ham, so that they could use it for meat.

Teacher. But why did they want to smoke it ?

Pupil. So that they could use it for preservatives.

Teacher. But why were they usually so anxious to preserve their meats ? Remember the time of year.

Pupil. They never knew when disease would come among their cattle.

Pupil. In winter time, when the ground was covered with snow, the sheep and cattle could not get food, so they would not be very fat and therefore no good for eating.

Teacher. And what did they do ?

Pupil. They had to kill their cattle.

Teacher. Yes, when autumn came round they killed their cattle, keeping only a small number of them to give them calves. Why don't we do that with our cattle in the autumn ?

Pupil. The winters in the seventeenth century were much fiercer.

Pupil. They knew nothing about turnips.

Teacher. Yes, that is the reason. When they had no grass they knew nothing about turnips or root crops. They had neither, and that is why there was so much meat preserved in the chimneys. But if you looked to-day at a seventeenth-century chimney, you might find something inside—that is, if you have any romance.

Pupil. A torturer.

Pupil. A ladder.

Pupil. A great chimney.

Teacher. Yes, there was a great chimney. There would be a possibility of finding that, because the chimneys were right up against each other. You have heard about those people who hid in the great chimneys, which were called priest-holes, because in latter days Roman Catholicism was not allowed, and priests who were being pursued hid in them. In the times of Charles I, who would be hiding in them?

Pupil. Cavaliers.

Teacher. Yes, Cavaliers or Roundheads. Now, there is one thing you ought to remember. You are sometimes told that most of the squires were Cavaliers. That is not quite right, but how do we know?

Pupil. Some of the squires wrote books.

Teacher. Yes, but what kind of book?

Pupil. A diary.

Teacher. Yes, a great many of them wrote diaries to tell us of what happened at that time, and most of the diaries are those of Roundheads. It was the greater nobles who were Cavaliers. Now we will leave the house for a while. But look at this; these were the only chimneys in the house. The other rooms did not have chimneys. The other rooms were perhaps a drawing-room and rooms for the ladies. But outside there would be all kinds of outhouses, where the work in connection with the estate was carried out. What would be a few of them?

Pupil. There would be a toolshed.

Teacher. Yes, a carpenters' shop. When I use the word shop I do not mean a shop in the sense we use the word to-day, such as a sweetie shop. It is in the sense of an engineering shop, a place where engineers work. The carpenters did their work there. Were there any other such places round about the house?

Pupil. Stables.

Pupil. A wood store.

Pupil. A dairy.

Pupil. A garage.

Teacher. Don't use the word garage until we are talking of motor-cars.

Pupil. A blacksmith's shop.

Teacher. Yes, they would need a blacksmith's shop to make shoes for the horses. But everything that was needed for the village was provided by the village. They did not send to London or any such place for food and clothing. Everything that was necessary for the village was got by the village itself. In these outhouses the work for the squire was done, as well as for the inhabitants of the village. But what else did the squire do if he was a decent and conscientious man?

Pupil. Looked after the estate.

Teacher. Yes, he would supervise the affairs of his estate. His main duty when he succeeded his father was to learn something about farming. We find that after the Restoration in 1660, the squires were beginning to leave their estates. They still continued to take the money from them, but where would they go to live?

Pupil. In the bigger towns.

Teacher. In which town especially?

Pupil. In London.

Teacher. Yes, in London especially. They followed the Court and went where the king lived. Still, at the time of which we are speaking most of them lived on their estates. But it was not a case of all work and no play. Reading in some of the old diaries, you would find in Northumberland and

Cumberland, and places in the Peak district, and in Yorkshire that some of the squires were not such admirable men, the reason being that their land was not so profitable. It was barren land, and it was difficult to raise crops. Therefore, you would find the squire spending most of his time enjoying himself. What was his main enjoyment?

Pupil. Hunting.

Teacher. Yes, hunting and fishing. What did he hunt?

Pupil. The fox.

Teacher. Yes, fox-hunting was popular, because the authorities in the villages offered a shilling per head for every fox killed. A shilling was a great deal of money in those days, but the fox was doing a great deal of damage to poultry, and the squire was very glad to join in the sport. What else would he hunt?

Pupil. Deer.

Pupil. Wild boars.

Teacher. I doubt if he would hunt the wild boar, because I don't think it was still in existence during the seventeenth century. He would probably hunt something less ferocious, like the otter and the badger. They would probably spend the whole week hunting these animals. If the weather was bad, they went down to the village inn and gathered in the cellars to drink. In districts like Norfolk and Buckinghamshire, however, the squires were keen to get the most out of their estates and they worked very hard, but farther north the squires were sometimes not to be admired so much for their ways. Now, what do you remember about the squire's wife? What would she be doing while he was busy managing his estate?

Pupil. She was a sort of village doctor.

Teacher. Yes, she attended the sick in the village and treated them with medicine which she would make from herbs. And

probably she would do a great deal of embroidery. What else would she do ?

Pupil. Weaving.

Teacher. No, not weaving. That is not exactly a lady's job, but she would do the job before the weaving took place. What was that ?

Pupil. Spinning.

Teacher. Yes, spinning the flax into linen thread. And probably she would be making a lot of wine—raspberry, black-currant, elderberry, and cowslip wine. Why do you think they needed so much wine ?

Pupil. They drank so much wine because they had nothing else.

Teacher. Yes, the real reason was that they had no tea at that time, and the water was impure, so wine was the common drink. Well, revise that for next day, and then we shall learn something about the town life during the seventeenth century.

QUESTIONS AND EXERCISES

References: Colvin, *An Introduction to High School Teaching*, pp. 224-43; Bossing, *Progressive Methods of Teaching in Secondary Schools*, pp. 386-92.

1. Count the number of questions asked during the period. How many begin with (a) "What ?" (b) "Where ?" (c) "Why ?"

To what extent do the "Why ?" questions involve real reasoning on the part of the pupils ?

From your study of the questions asked, what conclusions do you draw as to (a) the teacher's purposes in asking them; (b) the teacher's main aim in the lesson; (c) any defects in this type of approach ?

2. The teacher's usual procedure (not followed on this occasion) is to have the class take notes of the main points of the lesson.

Compare the following methods of carrying out this part of the lesson and list them in order of merit, giving reasons for your choices. (N.B.—Average age of pupils—11-12.)

(a) Allow pupils to take rough notes as the lesson goes on, and give ten minutes at the end of the period for the notes to be written up properly in a special note-book.

(b) Take ten minutes at the end of the lesson to dictate a summary or have the class copy it from the blackboard.

(c) Give out mimeographed sheets of notes, and announce that knowledge of the notes will be tested at the beginning of the next history period.

(d) Allow ten minutes at the end of the period for pupils to write their own summaries, using the text-book as a reference where necessary. Forbid note-taking during the rest of the lesson.

(e) Require notes of lessons to be written up outside of the class period, and check up the work by regular examination of the note-books.

(f) Give headings for the main points of the lesson and ask the class to copy these and write one sentence on each during the last ten minutes of the period.

What alterations would your choice of methods undergo if the pupils of the class were aged sixteen?

3. In teaching, it is usually desirable to present the same facts more than once and, if possible, in more ways than one, as otherwise the pupils will attain a very incomplete mastery. Assuming that at least two repetitions are necessary in one period (with further repetitions in later periods), discuss the advantages and disadvantages of each of the following methods of presenting and re-presenting the same material:

(a) Silent reading of the whole lesson in the text-book, followed by oral question and answer, with explanation of doubtful points by the teacher.

(b) Lecture by the teacher, followed by the pupils' reading the text-book and asking for help on any doubtful points.

(c) Question and answer method to elicit as much as possible from the class with the teacher giving short explanations from time to time (as in the above lesson), followed by silent reading of the text-book by the class.

(d) Oral reading of the lesson from the text-book paragraph by paragraph, each paragraph being followed by questions and amplification by the teacher.

Suggest any other method, or combination of methods, which you would prefer to these.

Which method would you select for use with:

- (a) Pupils aged twelve (as in the lesson taught);
- (b) Pupils aged sixteen;
- (c) A dull and backward class which finds difficulty in mastering even elementary facts;
- (d) A bright class, quick to see relationships and eager to contribute to discussion?

Which method would you use in teaching:

- (e) A lesson containing a good deal of reasoning and depending on appreciation of cause and effect;

(f) Material of a predominantly factual type?

4. Taking ten lines of print as a minimum standard for examples of "telling" the class (i.e. miniature lectures), count how many examples of such "telling" were used in this lesson.

In this case, do you think that telling was likely to increase or decrease the interest and attention of the class, as compared with the question and answer procedure used during the remainder of the lesson? Give reasons for your answer.

What faults does a good teacher try to avoid in using the "telling" method? To what extent were these avoided in this case?

5. Was the principle of apperception well or badly applied in introducing this lesson? Give reasons for your answer.

VIII HISTORY

CLASS: Fifth-year (average age 16), of 29 boys

TITLE OF LESSON: THE FRENCH REVOLUTION

N.B.—The lesson had begun a few minutes previously.

Teacher. . . . The next thing was that the Central Government tried to get complete control of affairs. The first great thing was to take away all the power from the nobles and leave them all their rights and privileges, so far as the Central Government was concerned. The result was that the Feudal system remained in France so far as the privileges were concerned. The nobility spent a great deal of time at Court and spent a great deal of money there, and that money had to be got out of the peasants.

It would be wrong to suppose that the French peasantry were worse off than the peasantry in England. In some respects they were not so well off, but they were better educated. That was one of the reasons the revolution took place in France because the bourgeoisie and the French peasantry were much better able to appreciate what was wrong in the country. In Poland, for example, they did not know. The French people knew better, and their opinion was influenced by a series of writers—

Pupil. Rousseau and Voltaire.

Teacher. Yes, and there was another man. His name starts with M—Montesquieu. He appealed to the more intellectual class, since his writings were more learned. Now what would you say were the characteristics of Voltaire's writ

ings? What was the sort of thing he did? Take it this way. Did he propound a new system or attack the old systems?

Pupil. He attacked the old systems.

Teacher. Yes, he was a critic. He attacked the Church. He attempted to destroy the old systems by pouring ridicule on them rather than suggesting what would be an improvement. Rousseau, on the other hand, had theories of improvement. What was his famous book?

Pupil. "The Social Contract."

Teacher. Yes, he put forward a theory in "The Social Contract" that was not new—that the Government was a contract between the ruler and the people. He said that it was the part of the ruler to govern well, and the part of the people to obey, and if either side broke their contract it was open to either side to repudiate it. In other words, if the king did not rule well, what could the people do?

Pupil. Remove him.

Teacher. Yes, but among the lower class of French peasantry education was not so good, and a great many people could not read. Yet they got to know about the opinions of those writers. How did that happen?

Pupil. People who could read told the others who could not.

Teacher. Where did they hear about them?

Pupil. In the inns.

Teacher. Yes, in the inns, the village public-houses. That is what happened. All through Europe the people were in the habit of gathering there and discussing the opinions. But what happens when people tell this sort of thing to each other?

Pupil. You get other ideas introduced.

Teacher. Yes. I don't think Rousseau would have recognised his own ideas if he had heard some of them in those

public-houses. The general impression that went about was that things were not satisfactory, and that they should be improved. The discontent of the people was fostered in that way. This writer Montesquieu was a great student of the English situation, which, I might say, he did not thoroughly understand. He represented it in a way that was not right and spoke about a suppression of the peers, which, as a matter of fact, did not exist. He told people what a confused country England was, and said it was all due to its system. In that way he added to the general discontent. There was another set of writers not very well known. They were known as the "Encyclopædists" because they wrote such large books. Those of you who read them will not regard them as very thrilling. What those people did was to write an article on kingship which was read by a certain number of people and which later filtered down through them to the lower classes.

People in France were thoroughly discontented. That was the attitude of the French Revolution. They did not know exactly what to do, but they knew their grievances. We know that from a list of them that was presented to the Assembly, and which is called the Cahiers. Can anyone tell me about the grievances of the people?

Pupil. They had to pay taxes to keep up the magnificence of the nobles and to pay for the foreign wars. They said they had to pay all the taxes.

Teacher. Yes, it was a case of the people who had least having to pay most. Is that our principle to-day?

Pupil. No.

Teacher. It is the other way round. We graduate the taxes according to the means of the people, and their ability to pay. Who were the two wealthiest classes in France? The nobles were one.

Pupil. The nobles and the clergy.

Teacher. Yes, the nobles were practically exempt from taxes. The clergy were not exempt from taxes, but they were in this position, that they were allowed to tax themselves. If you were in a position to fix your own taxes, what would you do?

Pupil. Make them as low as possible.

Teacher. Yes, and what is that?

Pupil. Nothing.

Teacher. Of course, the clergy had from time to time to make a gift to the king. If they did not give him enough, he got cross and threatened to squeeze a bit more out of them. Were all the clergy rich?

Pupil. The abbés and the bishops were very wealthy, but the parish priests, who were drawn from the poorer class, were not so wealthy.

Teacher. Yes, that had an important bearing on the French Revolution. All these things led to discontent, and the winter before it there was a famine in the country. There was no adequate means of relieving it because there was not enough money. The taxation system was so bad that the taxes were anticipated by several years. That is, you were paying in 1780 the taxes levied in 1780, but the Government were spending the money they expected to get in 1785. How did they do that?

Pupil. By borrowing it.

Teacher. Yes, they borrowed it, and as time went on the interest grew and they got more heavily into debt. What was obviously necessary if France was to be sound financially?

Pupil. The people who had the money would have to hand it over.

Teacher. Yes, the only way of doing it was to get the nobles

to pay their share of the taxes. The king could not make them do that, though they were in a position to do so. The Government called in a Swiss named Necker to tackle the problem, but however much he juggled with it he could not put it right. There was another aspect that gave the peasantry a very bad view of their landlords. Can you tell me what irritated the peasants?

Pupil. The nobles had the right to ride over their tenants' land. The nobles let their pigeons go over the peasants' land.

Teacher. What was the objection to the pigeons?

Pupil. They ate the crops.

Teacher. Yes, the nobles said if you do not pay your rent, you must let our pigeons eat your corn. As the corn was the thing with which the peasant paid his rent, he could do nothing, and his burden grew heavier. He could not restrain the noblemen.

Then there was the Gabelle, or salt tax. Whether he used it or not, the taxpayer had to buy salt. Unfortunately some people had to buy salt for the food they did not have to eat. It was a very awkward position. Then there was the system of forced labour—the *corvée*. If a road was being made, the way adopted was to assign a stretch to the people of one particular village. The fact that they had to work for the Government as well as their landlords caused a feeling of great discontent among the peasants, and it was in these conditions that the king and his nobles summoned—

Pupil. The States-General.

Teacher. Yes, and it had not met for a very long time.

Pupil. About a century and a half.

Teacher. And as nobody had been at the last meeting, nobody was quite sure of what was to be done. How many divisions were there?

Pupil. Nobles, clergy, and commons.

Teacher. What was the first great question? It was how this body should sit when it came together—should it sit in three separate estates or should it sit together? What would be the disadvantages from the peasants' point of view if it sat in three separate estates?

Pupil. They would be overruled.

Teacher. Yes, anything they passed could most certainly be thrown out by either of the two other houses. The king, Louis XVI, was not a strong man, and he compromised by giving the lowest house twice as many members as the other two. That did not matter, as their decision only counted as a third of the whole decision. However, when they met, the Third Estate had twice as many people as the other two put together and they demanded that they should meet in one body. Who wanted to go with them?

Pupil. The poorer clergy.

Teacher. Yes, when they got the National Assembly together, the majority of the poorer clergy went with them. One famous noble, Mirabeau, went with them too. With their majority, and the Assembly meeting as one body, you could be quite certain that the wishes of the Third Estate would prevail.

Operating a lantern, the teacher showed the class some pictures of characters of the period.

1. A bust of Voltaire.
2. A portrait of Lafayette—"He went to America with the French troops and fought with the American army on the side of George Washington. His soldiers and he brought back to France the ideas they had learned in America."
3. Mirabeau—"The other man I want you to see is one noble who went on the other side. He was not very popular with the rest of the nobles, but he had a great idea of being a

constitutional minister. He wanted to see the Monarchy preserved with Mirabeau as Prime Minister. The difficulty was that some people did not trust him. The king and the queen were among them."

4. Louis XVI—"This is the man who was responsible for most of the trouble. He looks impressive enough in his coronation robes, but that does not mean much. They had a name for John Baliol that would have suited him. Do you know what that was? Toom Tabard. What is a tabard?"

Pupil. A kind of tunic.

Teacher. Who wears them?

Pupil. A herald.

Teacher. Yes, you know those things the heralds wear all done up with gold. They are so stiff that if you took them off they would stand up by themselves. John Baliol was like that—if you took his tabard off he was base inside—there was nothing in it. Louis was like that.

4. Marie Antoinette—"On the flight to Varennes she was carrying that picture when they were stopped, and a man put a knife through it. It was lucky he did not put it through her, though it might have been as well, for later she had her head cut off."

5. Levée de Justice—"Louis used this when he summoned Parliament to tell them off, and when he did that they had to do what he said. Why they paid more attention to what he said in bed than when he was up and dressed, I don't know, but that's what happened."

QUESTIONS AND EXERCISES

1. The lecture type of teaching was used for most of this lesson. What would be the disadvantages of this method if it were used with younger boys, e.g. aged 11-12?

Which of these disadvantages still apply to this class, which had an average age of sixteen?

What are the advantages of this type of presentation as compared with the developmental type of lesson? (Reference: Bossing, *Progressive Methods of Teaching in Secondary Schools*, pp. 367-79.)

Which of the advantages listed by Bossing do you think were actually secured in this lesson?

2. When a lesson is being given mainly in lecture form, what purposes should be served by the teacher asking questions in the course of the lecture? On this basis discuss the usefulness of the questions asked during this lesson.

3. Check the main points of the lecture against an up-to-date text-book presentation of the causes of the French Revolution, designed for use with the senior classes in secondary schools. Justify or criticise the chief omissions and additions in the teacher's presentation of the topic. What are the advantages and disadvantages of the text-book presentation as compared with the lecture method?

4. Discuss the use of lantern slides in this period with reference to:

- (a) Its general values for the pupils;
- (b) The verbal comments on the slides;
- (c) The place in the period of this part of the lesson.

5. The equipment of this history room included the following:

(a) Glass-covered bulletin boards all along one side of the room in which were displayed pictures and plans of castles and other historical buildings, reproductions of old manuscripts, treaties, etc., medals, portraits of historical characters.

- (b) Maps.
- (c) An historical wall-frieze round the room.
- (d) Epidiascope and screen.
- (e) Book-case with library of historical books.

What special equipment, in addition to general classroom equipment, would you desire in a room devoted to your special subject? Make a list of items and write notes of your own methods of using each.

IX

GEOGRAPHY—AUSTRALIA

CLASS: Third-year (age 13-14) of 35 boys

Atlases were distributed—one to each pupil.

Teacher. This is a rough diagram of Australia (draws an outline map on blackboard). The first thing I want to give you is its position. Look carefully at your atlases and see what line of latitude cuts through Australia.

Pupil. Forty degrees.

Teacher. I don't like that. It is only half true.

Pupil. South.

Teacher. Well, here is a line 10° S. From the fact that Australia lies south we can discover something about its seasons. If it is winter here, what is it in Australia? This summer I have just come from New Zealand. What season did I leave behind?

Pupil. Spring.

Teacher. So I have had the misfortune to experience two winters running over here.

You can observe the seasons from the games played in Australia. What are they playing now?

Pupil. Cricket.

Teacher. Another thing: 10° S. and 40° S., how many degrees from north to south?

Pupil. Thirty degrees.

Teacher. How many miles in one degree ?

Pupil. Seventy.

Teacher. Then how many miles, roughly speaking, from north to south ?

Pupil. Two thousand one hundred.

Teacher. Yes, in other words——

Pupil. Two thousand.

Teacher repeats figures on blackboard.

Teacher. We have no method of judging the distance west to east except by the eye, or by the scale of the map. Look at it and see what you think the distance is east to west.

Pupil. Two thousand five hundred miles.

Teacher. You are quite right. The area is 3,000,000 square miles, and in that vast area you have a population of only six and a half millions.

Now if you spread that population out, how many people have you to the square mile ?

Pupil. Two.

Teacher. And we call that density. That is very small compared with Britain, which has an average of 500 people per square mile. You notice that in the southern hemisphere there is a great difference in longitude.

Look at it on your map. I want you to look and find the longitude of that city (indicating Melbourne) here. What is it ?

Pupil. One hundred and forty-five.

Teacher. What is the same as one degree ?

Pupil. Four minutes.

Teacher. If you are in doubt about that, here is a simple way to work it out.

Turning the globe:

Teacher. How long does the earth take for one complete spin?

Pupil. A day.

Teacher. And what is a day?

Pupil. Twenty-four hours.

Teacher. And how many degrees does it turn through in one complete spin?

Pupil. Three hundred and sixty degrees.

Teacher. Here it is on the board:

$$\begin{aligned} 360^{\circ} &= 24 \text{ hours} \\ \text{Therefore } 1^{\circ} &= \frac{24}{360} \times \frac{60}{1} \\ &= 4 \end{aligned}$$

If you are ever in doubt, you know how to work it out. What is the difference in time between Melbourne and London? Work it out on your jotters. It is quite easy. Stand up anybody who does not know how to do it. The difference in hours and in minutes?

Pupil. Ten hours.

Teacher. Exactly ten?

Pupil. Just under ten.

Pupil. Nine and two-thirds.

Teacher. Working it out, we have nine hours forty minutes.

Looking at his watch:

The time just now is 11.55 a.m. So we will have to add on nine hours forty minutes.

Working at blackboard:

So we have 9.35 p.m.

Just now you fellows are thinking about your lunch, while the people in Australia are thinking about putting their children to bed.

Now, look at the structure of Australia.

Drawing on board:

Round here we have a great plateau. It is very high and very wide, and we give it the name of the Western Plateau. Now look in the east. What do you find there? You will find mountains. What is the name of the ones in the north?

Pupil. The Hughenden Range.

Pupil. The Great Dividing Range.

Teacher. Yes, and those down here?

Pupil. The New England Mountains.

Teacher. What do you call these?

Pupil. The Australian Alps.

Teacher. And those opposite Sydney?

Pupil. The Blue Mountains.

Teacher. And so you have the Great Dividing Range, the New England Mountains, the Blue Mountains, and the Australian Alps.

Now we have an area of Lowland. That area gets its name from the great gulf there. What is it?

Pupil. The Gulf of Carpentaria.

Teacher. And so we call it the Carpentarian Lowlands. Over here (indicating position on diagram) we have another belt of Lowland, and in the centre of it a great lake. What is its name?

Pupil. Lake Eyre.

Teacher. This area of Lowland takes its name from that,

and is called the Lake Eyre Basin. Then there is another area of Lowland, and in it a river. What's it called?

Pupil. The Murray.

Teacher. The Murray has a big tributary, the Darling, and so we call that area the Murray-Darling Basin.

Now we have mountains in the east, in the west a plateau, and what have you from north to south in the centre? What do you call them?

Pupil. Lowlands.

Teacher. So here are your physical features.

Writing them on the board:

1. Western Plateau.

Now I will tell you something about it you cannot tell from the map. The Western Plateau is made up of old hard rocks, excepting a little bit here and there of soft limestone. When you have that, what sort of coast-line will you have?

Pupil. Irregular.

Teacher. We had a tremendously rough passage before we got into Fremantle. It was so bad that a lot of people decided to take the train across to Melbourne. Some got off at Adelaide. What do you call that great bay there?

Pupil. The Great Bight.

Teacher. You can travel by train for a thousand miles without ever crossing a permanent stream. How is that there are no permanent streams in that part of the Western Plateau?

Pupil. The water just soaks through the limestone.

Teacher. That is the first part of the structure, then. What did you give me as the second division?

Pupil. The Central Lowlands.

Teacher. I will divide them into two sub-divisions. Who will give me the first?

Pupil. The Carpentarian Gulf.

Teacher. And the second?

Pupil. The Eyre Basin.

Teacher. The streams come down this way. Very often on the map they are dotted with a line. What is there?

Pupil. There used to be a river which is dried up.

Pupil. Sometimes the river is dried up, and sometimes it is flowing.

Teacher. What time is it dried up?

Pupil. Summer.

Teacher. There is an interesting thing about Lake Eyre. It is not all a lake. I wonder what part really is. Does anybody know?

Pupil. The centre.

Teacher. Not actually the centre. In the centre you will find Lake Disappointment. The story goes that an explorer who was suffering from thirst saw the lake, and he hurried to it, but when he got there, what did he find?

Pupil. A salty depression.

Teacher. That is what you find about Lake Eyre, a salty depression. A great part of it is dry. What is that part?

Pupil. The Murray-Darling Basin.

Teacher. There is another depression. Here is another lake.

Pupil. Lake Torrens.

Teacher. If you continue Lake Torrens, you get a gulf.

Pupil. The Spencer Gulf.

Teacher. What actually happened, geologically speaking, is that a great crack occurred about here. If you look in the Atlas you will see something about Lake Eyre.

Pupil. Part of it is below sea-level.

Teacher. And because it sank they called it Rift Valley. Now we come to the third big division. What is it?

Pupil. The Eastern Range or the Eastern Highlands.

Teacher. Now the Eastern Highlands can be broken up into A, B, C, D, but you will do that later as an exercise.

Now the next thing to do with the physical features of Australia has to do with the minerals. We study the geological structure of it, but the things we want to be interested in are what we find under the surface. In the hollows of those mountain ranges you get a lot of minerals. You do not get any in the south in the limestone region, and you do not get much here. From the development of Australia I wonder what was the most important mineral?

Pupil. Gold.

Teacher. Quite right. Gold was a very important mineral in the early days.

Drawing on the blackboard:

We have Gold—Kalgoorlie

Coolgardie .. Western Australia.

What is your name again?

Pupil. H. . . .

Teacher. Well, you try and be bright.

There are also:

Ballarat

Bendigo .. Victoria.

Now, there is another one up here:

Charters Tower . . . Queensland.

Yes, gold was very important in the days of early development of Australia. Tell me how?

Pupil. People went out there to try and get gold.

Teacher. And did they all get it?

Pupil. No.

Teacher. And the fellows who did not were compelled to turn to something else.

Pupil. Agriculture.

Teacher. Yes; what was the start of people going to Australia?

Pupil. A penal settlement.

Teacher. Yes, that is a big word for a little chap like you, but that was the real reason.

They sent out convicts there. At one time there used to be great rivalry between New Zealand and Australia, but the Australians always maintained that their early settlers were superior. They said they had been selected by the best judges (laughter). Most of the people who went out there of their own accord went in search of gold, but a lot of them were disappointed and some of them returned. Others who went out saw that a gold rush would bring a demand for other things such as foodstuffs, and through time other industries were developed. Nowadays gold is not so very important in Australia. The mines in Kalgoorlie are showing signs of exhaustion, and in Charters Tower they are diminishing. What mineral to-day is likely to help a young country to develop most?

Pupil. Silver.

Teacher. No, I don't think silver would help it greatly.

Pupil. Coal.

Teacher. Quite right. Australia is well off for coal. The biggest field is there:

Coal . . . New South Wales

Teacher. Look in the region I have indicated and see a name that is connected with coal. You should know it from your knowledge of Britain.

Pupil. Newcastle.

Teacher. There are smaller coalfields up in Queensland. See if you can get their names.

Pupil. Cairns.

Pupil. Cooktown.

Teacher. Yes, here they are:

Cairns, Cooktown, Townsville, Ipswich . . . Queensland.

Now, along with coal look for another mineral of some help in modern industry.

Pupil. Iron.

Teacher. Yes. Iron you will find here and iron you will find there. You will notice the iron is far removed from the coal, and so you have to take it there. Why don't you take coal to the iron? Because you require three tons of coal to smelt one ton of iron. The smelting works are usually round the coast here. Now give me just another mineral.

Pupil. Silver and lead.

Teacher. There is another mineral.

Pupil. Copper.

Teacher. There is one interesting thing about copper. When the price is high they are working at full pitch, but when it is low they are all practically shut up. They are not working very much at present.

NOTES ON THE LESSON

The outline map on the blackboard was filled in with different colours of chalk as the lesson proceeded. An outline of the main points of the lesson was also written up and was copied down by some of the pupils. In the next lesson the climate and crops would be studied, and in the third lesson on Australia industry and commerce would be taken up.

As home-work the pupils are held responsible for reading in their text-book the work covered during the period, and there would be a ten-minutes' oral revision and test at the beginning of the next period. Further consolidation would be obtained later by having the pupils draw maps (out of school hours), incorporating the main points studied in the three lessons.

QUESTIONS AND EXERCISES

1. Merely to tell the class a fact once is not usually considered to be good teaching. How did this teacher avoid monotony in making the necessary repetitions, e.g. of names of physical features (pp. 87-90) ?

By what other means did he deepen the impressions he desired to make ?

2. The bare facts of this lesson were not in themselves of great interest to the class. Make a list of the means used by the teacher to prevent the lesson becoming wearisome. Which of these could be applied to a factual type of lesson in your own subject ?

3. What advantages are there in the teacher's filling in an outline map on the blackboard, as compared with his pointing on a large wall map ? What general principle would you deduce from this in regard to your own blackboard work ?

Would it have been better to have pupils come to the blackboard to fill in the outline ? Give reasons for your answer, and try to develop a general rule for using or not using pupils to work at the blackboard.

4. Consider the teacher's method of using the text-book (as given in the above Notes). What are the aims of this type of assignment of home-work ? Compare its value with assigning a certain number of pages covering the material of the lesson to be read *before* the work is taken up in class. How would this latter plan affect the teacher's treatment of the lesson in class ?

5. The "directed study" method of teaching this lesson might be on these lines. The teacher distributes outline maps of Australia and a series of questions and exercises covering the main points of the lesson. The questions are answered by the pupils in notebooks and by filling in the outline maps. Pupils are allowed to work at their own pace, but unfinished work has to be completed out of school. The teacher supervises, corrects and assists pupils individually or in groups as they need help.

What would be the advantages of this method as compared with the method used?

What might be its defects and how could they be avoided?

Read the chapter on "Supervised Study," in Waples, *Procedures in High School Teaching*, Chapter VIII; Reeves, *Standards for High School Teaching*, Chapter XIII; or Bossing, *Progressive Methods of Teaching in Secondary Schools*, Chapter XVII, then prepare an outline for a lesson in your own subject, using the directed study method.

X

GEOGRAPHY—CHILE.

CLASS: Second-year (age 12-13), of 28 girls

Teacher. Our examination included South America, particularly Argentina and Brazil. We are going on to Chile. Before you know anything about South America, you must know your A B C—Argentina, Brazil, and Chile. We notice something very big about Chile, which strikes most people particularly.

Map drawn on the board.

Teacher. If we imagine that to be South America, we might perhaps be able to insert the boundary of Chile. What is its shape?

Pupil. Very long and narrow.

Teacher. Yes. From its shape we are told something very important about Chile.

Pupil. Its varied weather.

Teacher. I don't think that is quite the right term to use.

Pupil. Its varied climate.

Teacher. Yes, the word climate is better. That is quite a natural assumption. You notice that Chile extends to a latitude well within the Tropics. How many degrees of latitude does it extend to?

Pupil. 17° South to 56° South—39°.

Teacher. We find Chile has a range in latitude of 39°. From that we can find how many miles long Chile is. But before

that we must find out how many miles there are to a degree. Does anyone know the circumference of the world?

Pupil. Twenty-four thousand miles.

Teacher. Yes, take it roughly at 24,000 miles. Look at this circle here. How many degrees are there in it?

Pupil. Three hundred and sixty.

Teacher. Therefore, how many miles are there in one degree?

Pupil. You divide 24,000 by 360.

Teacher. Yes, 67 miles roughly. If we take this as 25,000 miles, we get 69 miles in one degree of latitude. Now about 39° .

Pupil. Multiply 69 by 39.

Pupil works it out at 2,691 miles.

Teacher. Well, for practical purposes we might say that Chile is almost 3,000 miles in length. We deduced that because of its great length, Chile would have a varied climate. We can actually name from what we know already the kind of climate South America will get in this northern region. Now, let me guide your reasoning. There is a very important thing, the Tropic of Capricorn, which cuts across the country. Its latitude is $23\frac{1}{2}^{\circ}$ South. All places north of that line will have what sort of climate? Provided that the countries are more or less on a level with the sea, we will have a tropical climate. Is there any place north of that line where the climate will not be tropical?

Pupil. The Andes.

Teacher. Why?

Pupil. Because they are higher than sea-level. The mountains will make the climate colder.

Pupil. The higher up you go, the colder the air becomes.

Teacher. Well, mountains have generally a cold surface, so you can see that altitude alters climate. You can have a place on the coast with a temperature of 90° F., and a place in the Andes, 9,000 feet high, only 60° F. The difference in temperature is due to the difference in altitude. Now I am going to put in the Andes.

Andes inserted in map on board.

Teacher. Here we have the Andes. You will notice the eastern frontier of Chile runs across the top of the Andes. What is a good word for "top"?

Pupil. Peak.

Pupil. Pinnacle.

Pupil. Crest or ridge.

Teacher. Yes, I think the best term would be that the eastern frontier of Chile runs across the topmost ridge of the Andes. Now, we do not know whether it is a flat plain or plateau, but this part of the country will not be so high as the top ridge of the Andes. So we call it a tropical climate, the only name to give to a place if it is within the Tropics. However, we have only considered the temperature, and we have not considered the rainfall. There are two things that make a climate. What are they?

Pupil. Temperature and rainfall.

Teacher. Well, what sort of rainfall will we have here?

Pupil. Rain all the year round.

Pupil. No, there will not be rain all the year round.

Teacher. When does it fall, then?

Pupil. There is hardly any rain at all, because of the Trade Winds.

Teacher. Now, we will take that to be the Equator. There is a certain belt of wind to be found between the Tropics and the Equator. What is it called ?

Pupil. A westerly wind.

Teacher. No, it is not a westerly wind. There are certain places where we find westerly winds. We find them in a temperate latitude. But remember, this we are talking about is a tropical latitude. What are the winds there ?

Pupil. The Roaring Forties.

Teacher. No, the Roaring Forties are comparable to our own westerly winds. Within the Tropics there is a definite wind system. The arrows I am drawing here show the direction of the prevailing winds.

Pupil. South-east winds.

Teacher. What is the full name ?

Pupil. South-east Trade Winds.

Teacher. I am not going to explain why the South-east Trade Winds blow in that direction; perhaps you will find out later. But you will find out something very important about the rainfall in the north of Chile.

Pupil. You will get no rain at all. There is no moisture in the winds.

Pupil. All the moisture in the winds is carried over the eastern side of the Andes.

Teacher. Now, this Trade Wind only starts here. It does not blow over the Andes at all. What is the reason for the lack of rain ?

Pupil. The winds blow off there.

Teacher. Is there any reason why the winds blowing off there should mean lack of rain?

Pupil. Rain is always brought by a wind that has plenty of moisture in it.

Teacher. Yes, if the wind has been on the land for a long time, it will have little or no moisture in it. It is wind from the sea that is wanted to bring rain. When a wind comes to a land, say, off the west of Scotland, from the sea, it has to do something.

Pupil. It has to rise.

Teacher. And what happens when it rises?

Pupil. It hits the mountains.

Teacher. And then what happens?

Pupil. The moisture in the wind condenses.

Teacher. But something happens to the wind first before the moisture condenses.

Pupil. It becomes colder and colder.

Teacher. Yes, it is always colder at the top of a mountain than at its bottom. You can always see that from the pictures you get of the snow-capped Alps. The moisture in the wind we are talking about condenses and may fall as rain. In the case of Chile, if the wind happens to blow offshore, it is taking its moisture away from it. So in northern Chile we have a very dry, arid land. What is it called?

Pupil. An arid land.

Pupil. An arid desert.

Teacher. Yes, we will put "arid desert" into the map in yellow chalk. It is the Atacama desert. Now here are North and South America. Would you expect to find any other

deserts in the same latitude? If you look at your maps, you will see that the deserts in the southern hemisphere are all situated on the west side of continents of similar latitudes, and you notice there that the Trade Winds are all blowing offshore. Now here is the Kalahari Desert in South Africa, and the Great Western Desert. You will now see how important the direction of the wind is to a country. Much of the wealth which Chile enjoys to-day has been obtained from its Atacama Desert. Northern Chile is a desert: nothing grows in the ground there. Where does it get its wealth?

Pupil. From minerals.

Teacher. Tell us more about it.

Pupil. They make mines and get the minerals out of the ground.

Pupil. Nitrate is found there and exported.

Pupil. Nitrate is used as an artificial fertiliser.

Teacher. Yes, nitrate is in great demand all over the world. It sells at a fairly big price. What is another of its uses?

Pupil. It is used for making explosives.

Teacher. So mining seems to be the sole occupation of the people in Northern Chile. Will mining there be carried out under favourable conditions? If not, why?

Pupil. It is too high.

Pupil. There is not enough water.

Pupil. Their water has to be carried.

Pupil. There is no means of transport.

Teacher. Of course, you could build a railway, though it is not going to be easy when your way is blocked by mountains. Here is the Pacific Ocean, and here is the first fold of the

Andes. The land falls very precipitously from there to the ocean floor, and it is not an easy matter to build jetties or breakwaters there because you cannot get foundations, with the result that the ships have to lie off in very insecure anchorages and have to load off lighters. You have such a steep slope down from the Andes that railways are actually impossible. There is a coastal plateau separated from the sea by a very narrow and very low ridge and this ridge slopes down very quickly to the Pacific. The result is that while the construction of railways is possible on the plateau there, it is very difficult for engineers to build a railway that will go down to the sea. So the miners here have a poor time of it, but the expense and the hard work involved have been justified by the demand for the minerals found. Nitrate is made into explosives and there is a great demand for it when two nations are at war. In the last war there was a great amount of Chilean saltpetre supplied. There was one country, Germany, cut off from outside supplies, but they found a way to manufacture their own nitrate. But there are other minerals to be found in the Andes. Do you know any of them?

Pupil. Copper and silver.

Teacher. Yes, silver, and when you say silver you can always say tin, because the two of them generally go at the same time. Once you associate mountains with minerals, you have always a source of great wealth. What else may you expect there?

Pupil. You will get volcanoes.

Teacher. If you have your three layers of rock like that, and this lowest layer contains gold, about 6,000 feet below the surface, the men on the job will never know it is there unless they bore a hole. In the course of time part of the mountain will be worn away through erosion, and the lower rock will perhaps come to the surface three or four times in a distance of five miles.

QUESTIONS AND EXERCISES

1. Make a rough calculation of the proportion of pupil to teacher activity by counting the number of lines of print contributed by the pupils and by the teacher respectively in the first three pages of the report. Then reckon what percentage of the talking was done by each. Do you consider the proportion of pupil activity sufficiently high to call this "pupil-centred teaching"? If not, what would you consider a satisfactory proportion? Make a few similar rough calculations from pages of other lessons to help you to form a standard. Check your standard by observing a few lessons by different teachers, using a stop-watch to determine the amount of time taken by the teacher's and pupils' contributions to the lesson and calculating the percentage.

2. Give examples from the lesson of the teacher's insistence upon precision in the use of geographical terms. Why is this insistence necessary?

Similarly, find three examples in the report of basic geographical facts or principles which are applicable to other countries. What is the importance of the emphasis on this type of fact? Suggest a few concepts of similar general importance in your own subject.

3. Is the type of reasoning used here mainly inductive or deductive? Give examples to support your answer.

4. The class could have read the chapter on Chile in their textbooks and had any difficulties explained in a much shorter time than would be required to "cover" Chile by the method used in this period. What values were secured by the method used as compared with the method of reading the text-book? Are they sufficient to justify spending (say) double the time to teach the geography of Chile?

5. Taking this lesson as typical of the teacher's method, what would you judge to be his main aim in teaching geography to children of 12-13 years of age?

To what extent do you think this aim is based on a wrong view of the possibility of transfer of training?

Select examples of specific training given during this period, which might be transferred: (a) to other subjects, (b) to other geography lessons, (c) to general habits of thought.

6. What change can be noticed in the teacher's treatment of the lesson during the last third of the lesson? What reasons can you suggest for the change? Are they sufficient to justify it? What danger would have to be avoided in this style of teaching? How would you try to avoid it?

XI
GEOGRAPHY—NORTH AMERICA

CLASS: Third-year (age 13-14), of 23 boys and girls
TITLE OF LESSON: REVISION OF NORTH AMERICA

Teacher. Keep your eyes on this map. Into how many physical features can you divide North America?

Pupil. Three.

Teacher. What are they?

Pupil. The Western Mountains, plain in the middle, and the Eastern Highlands.

Teacher. Yes, and the Western Mountains are continued off this map into another country——

Pupil. South America, the Andes.

Teacher. The most famous range in North America?

Pupil. The Rocky Mountains.

Teacher. Any other range?

Pupil. The Coast range.

Teacher. Can you name any famous canyon in that range?

Pupil. Grand Canyon.

Teacher. What is the great natural barrier?

Pupil. The St. Lawrence.

Teacher. And to the south of it we have?

Pupil. The Appalachian Mountains.

Teacher. In between the East and West ranges of mountains you have a plain. When you have a plain in between and a reasonable amount of rainfall, what do you look for? Mountains, plain, highlands, rainfall——

Pupil. Plenty of rivers.

Teacher. What are the names of the great river systems?

Pupil. Mississippi and Missouri.

Teacher. Where do most of the tributaries of the rivers rise?

Pupil. The Appalachian Mountains.

Teacher. Look at the course some of those innumerable rivers take. How do you think they will flow? What is the word?

Pupil. Swift.

Teacher. What do you call a swift river?

Pupil. A rapid river, a cataract, a torrent.

Teacher. Some of those rivers are so rapid that they have cut a deep impression in the ground between their banks. What do you call this?

Pupil. A canyon.

Teacher. Some of the rivers flow more slowly. Why?

Pupil. The mountains are not so high.

Teacher. What is the difference between the two?

Pupil. The slower rivers are used for shipping.

Teacher. What do you call a river that can support shipping?

Pupil. A navigable river.

Teacher. North America is a great land mass. Itself, it is not a continent, but it is almost large enough to be a continent. What is the name we give to it?

Pupil. A sub-continent.

Teacher. What do you know about the types of climate in a sub-continent?

Pupil. They are of various types.

Teacher. Why should that be so?

Pupil. One end is near the Equator and the other end is near the Arctic.

Teacher. What are the three things that determine climate?

Pupil. Altitude, latitude, and distance from the sea.

Teacher. Take the top of the map here, at the top of Canada. What sort of climate will you get there?

Pupil. Arctic.

Teacher. What is that?

Pupil. Very cold all the time in most parts.

Teacher. Farther down along this part of Canada, what will influence the climate?

Pupil. Latitude.

Teacher. What do you call that?

Pupil. Distance from the Equator.

Teacher. What sort of climate would you call that?

Pupil. Sub-equatorial.

Teacher. What are its features?

Pupil. Rain both summer and winter.

Teacher. Down here, in the centre of the United States, in the interior of the land mass, what is the prevailing factor so far as the climate is concerned ?

Pupil. Distance from the sea.

Teacher. Yes, a continental climate. What are its features ?

Pupil. Warm summers, very cold winters, with summer rains.

Teacher. And to the east round about California we have ?

Pupil. The Mediterranean type of climate—long, dry summers and mild, wet winters.

Teacher. And down about the Gulf of Mexico, what influences the climate ?

Pupil. Altitude.

Teacher. And what is the other type of climate we have not mentioned yet ?

Pupil. A maritime climate.

Teacher. Which country has a climate like that ?

Pupil. Great Britain.

Teacher. What are its features ?

Pupil. Not too hot in summer and not too cold in winter.

Teacher. Name the five types of climate to be found in North America ?

Pupil. Arctic, Continental, Mediterranean, Sub-equatorial, and Maritime.

Teacher. Why is climate important so far as the occupation of man is concerned ?

Pupil. Crops depend on it.

Teacher. Up in Northern Canada here we have the Arctic type of climate. What will man do; how will he occupy his time?

Pupil. Trapping.

Teacher. Round about here you have the Sub-equatorial type of climate. What will you get there?

Pupil. You will have a wheat belt.

Teacher. Yes, and down here, where it is getting warmer, you will get maize, and farther south tobacco, and down here you will get cotton, and round by the Mediterranean what do you find?

Pupil. Fruit.

Teacher. Now let us look at the industries. North America is a great industrial country. What is the name we give to those industries associated with steel and iron?

Pupil. The heavy industries.

Teacher. Yes, the heavy industries. Name some of the things manufactured in the heavy industrial area.

Pupil. Motor-cars, steam-rollers, safety pins.

Teacher. Where are the heavy industrial areas in North America?

Pupil. Canada.

Pupil. Pennsylvania.

Teacher. What is the great industrial town in North America?

Pupil. Pittsburgh.

Teacher. What is the word used for other industrial products?

Pupil. Textiles.

Teacher. Yes. The manufacture of the raw cotton is an important industry. What is it you need before you can make the cotton into something?

Pupil. Coal.

Teacher. Yes. Well why don't they take the cotton to places where there is coal instead of setting up factories in the cotton-fields?

Pupil. It is cheaper to take coal to cotton than to take cotton to coal.

Teacher. Yes. Look at Newfoundland. You have an important industry there. What is it?

Pupil. Cod fishing.

Teacher. What important bank lies there?

Pupil. Dogger Bank.

Teacher. And round about Vancouver you get other industries.

Pupil. Salmon fishing.

Pupil. The canning industry.

Teacher. Up in Quebec there is a very important industry.

Pupil. Asbestos.

Teacher. Asbestos. Something more important?

Pupil. Lumbering.

Teacher. Yes, lumbering. What is another country associated with lumbering?

Pupil. Norway.

Teacher. Yes, and down here in Texas we have another important industry. What is it?

Pupil. Oil.

Teacher. Round about Hollywood, there is a very important industry. Does anyone know it?

Pupil. Yes, the film industry.

Teacher. Is that an industry? Tell me why.

Pupil. It brings money to America, and employs a great number of people, apart from the actors and actresses.

Teacher. Yes. Well go over the industries again.

Pupil. In the Arctic region trapping is carried on. Farther south we have wheat; farther south still, maize; and farther south again, tobacco and maize. In Quebec there is lumbering, coal and iron in Pennsylvania, the textile industries in the New England States, oil in Texas, fishing industry in Newfoundland, canning and fishing industry in British Columbia, and the film industry in Hollywood and Los Angeles.

Teacher. Yes. Now into how many political divisions can you divide North America? How many countries own North America?

Pupil. Two, Canada and the United States.

Teacher. How about Mexico? Surely it comes in. Three countries own it. What are they?

Pupil. Canada by Britain, United States by United States, and Mexico by Mexico.

Teacher. What is the name of the capital city of Canada?

Pupil. Ottawa.

Teacher. What is the capital of the United States?

Pupil. Washington.

Teacher. What is the capital of Mexico?

Pupil. Mexico City.

Teacher. What is the name of the Governor-General of Canada?

Pupil. John Buchan.

Teacher. His other title?

Pupil. Lord Tweedsmuir.

Teacher. What is the name of the President of the United States?

Pupil. Roosevelt.

Teacher. Yes, and what's his opponent's name. See who reads the papers.

Pupil. Landon.

Teacher. And who's the President of Mexico? Well, leave that one out. I don't even know his name.

The pupils were asked to take down the following geographical terms on their jotters and define them:

Tundra, altitude, pampas, paramos, continental shelf, escarpment.

Pupil. Tundra is snow-bound waste near the Arctic.

Pupil. Tundra is the vegetation of the land near the Arctic.

Teacher. Yes, you find it in North Canada. Where else?

Pupil. Northern Asia, Scandinavia, Siberia, Finland, South Pole.

Pupil. Altitude is the height above sea-level measured in feet.

Pupil. Pampas—a stretch of land in South America used for wheat growing and cattle rearing.

Teacher. What name do you give to the Pampas of North America?

Pupil. Prairie.

Teacher. In Russia?

Pupil. Steppes.

Pupil. Paramos—the area 10,000 feet above sea-level.

Pupil. Continental shelf—the continuation of the land into the sea round an island.

Teacher. It is a continuation of land under the sea not only as far as an island is concerned, but as far as the sea is concerned.

Pupil. Escarpment—a gentle slope-up from a sudden precipitous descent.

Teacher. An example of that near here?

Pupil. Salisbury Crags.

For the last ten minutes the pupils were told to read their text-books silently.

QUESTIONS AND EXERCISES

Note.—None of the work covered in this period was new. The aim of the lesson was to prepare for an examination which was to follow in a few days. The work fell into three phases; namely: (a) rapid-fire oral questioning (twenty minutes); (b) informal written test of definitions of geographical terms (ten minutes); (c) individual study of geography text-books (ten minutes).

1. Count the number of questions asked during the first phase of the lesson (pp. 103-110), occupying twenty minutes. Work out the average number of questions asked per minute. Make a similar calculation for the previous lesson on the geography of Chile, which took forty minutes. Account for the difference in the rate of questioning. On what grounds would you criticise or justify the

rate of questioning adopted by the teacher in each case? Try to state the reasons for the difference as a principle to guide your own practice in oral questioning. (Reference: Waples, *Procedures in High School Teaching*, pp. 111-15; Bossing, *Progressive Methods of Teaching in Secondary Schools*, pp. 303-5.)

2. Note the teacher's method of dealing with a wrong answer to a question, e.g. p. 107, l. 22, and p. 108, l. 15.

Is this sufficient correction to establish the right response in the pupil's mind: (a) in a revision lesson; (b) in a new lesson which involved thinking out principles, e.g. the lesson on Chile.

Give reasons for your answers.

3. It will be noticed that the teacher very seldom repeats a pupil's answer to a question. Why is this considered a good point of technique, and specially so in rapid-fire questioning?

4. A defect of some drill questioning is that it is too haphazard. How did this teacher avoid that defect?

How would you state this point as a positive principle to guide a beginning teacher in preparing a series of rapid-fire questions?

5. How do the questions on p. 106, l. 21, and p. 109, l. 8, differ from the other questions used? What is their particular value in this lesson?

6. Variety is specially necessary in drill work. How was it provided in this period?

The work in the last phase was comparatively ineffective. Suggest a reason for this and outline a method by which it might have been improved.

7. Read the chapter on "Review," in Reeves, *Standards for High School Teaching*, Chapter XXXIII; Bossing, *Progressive Methods of Teaching in Secondary Schools*, Chapter IX; or Waples, *Procedures in High School Teaching*, Chapter XIX, and then give a general criticism of this lesson as an example of review technique. Suggest an approach by which this lesson might have been taught on the lines given by the writers mentioned.

XII

PHYSICS—FLOTATION

CLASS: First-year (age 11-12) of 19 boys

Teacher. Suppose you put a cork into water. It floats. Then suppose you put something else—this metal cube here—into water. It sinks. How does it happen that cork floats when iron sinks?

Pupil. Iron is got out of the ground.

Pupil. The density of the iron is much greater than that of the cork.

Pupil. The mass of the iron is greater than that of the cork.

Pupil. The cork is full of air, and that makes it float.

Teacher. Well, the iron sinks because its mass is greater than that of the cork? If we put that to the test on the weights, the conclusion is that F is wrong. He said that the mass of the metal cube was greater than that of the cork. Well, the iron sinks and the cork floats. So what about the mass in connection with flotation?

Pupil. It has nothing to do with it.

Teacher. It is not the mass that has to do with flotation?

Pupil. It is its volume.

Teacher. Well, here is a piece of plasticine. What will we do with it?

Pupil. If you change it into a boat, it will float.

Teacher. Well, here it is in a lump. It sinks in water. Somebody here has the patent idea that if you make it into the shape of a boat it will float.

Plasticine in shape of boat is put into water. It floats.

Teacher. Is there any change in its mass? Obviously it does not sink or float because it has so many grammes. What have I done?

Pupil. You have made it hollow.

Teacher. What else have I done?

Pupil. Altered its volume.

Teacher. Well, do you know how to get density from that? I will put it on the board:

$$D = \frac{M}{V}$$

It is not mass that counts, but volume or density. Which had the greater density? The cork had a greater mass, but the volume of the cork is so great that its density is much less than that of the iron. What is the density of iron?

Pupil. 7·8 grammes per c.c.

Teacher. We have found that iron is denser than the cork. Now, does the cork float because it is less dense than iron?

Pupil. Yes.

Teacher. Has anybody else any ideas on the subject?

Pupil. The pressure of the air is equal to the pressure of the water. The pressure of the air inside the cork has the same pressure as the water on both sides.

Teacher. I don't think you have quite got the idea. Here is a bit of aluminium. Which is denser?

Pupil. Iron.

Teacher. Yes, the density of aluminium is 2.7 gms. per c.c. Yet the aluminium doesn't float. Cork floats because iron is denser than cork. Now, just have a look at this. Here is some mercury. What is the other name for mercury?

Pupil. Quicksilver.

Teacher. Well, here is our iron-cube experiment. It is not true that iron sinks. Here it is floating in mercury.

Pupil. It depends on the liquid it is put into.

Pupil. The density of the cork is less than the density of the water.

Teacher. The density of water is 1 gm. per c.c., and that of cork is .15 gm. per c.c. We know that cork is less dense than iron. Is that what makes it float in water?

Pupil. No, the density of the cork is less than the density of the water.

Teacher. Now, here is mercury. We have said that cork floats in water because its density is less than that of the water. How about the density of mercury? How does it compare with iron?

Pupil. The iron floats. Mercury's density is greater.

Teacher. Yes, the density of mercury is 13.6 gms. per c.c. A body floats, not because it is heavier, but because the density of the liquid is greater than that of the solid. A great ship like the *Queen Mary* floats because the density of the whole ship is less than the salt- or fresh-water around it.

Teacher. Here is a piece of glass. Will glass sink?

Pupil. We don't know unless we know its density.

Teacher. Yes, we don't know until we have found out whether its density is greater or less than that of the water. The density of glass is somewhere about 2.5 gm. per c.c. Will it sink or float?

Pupil. Sink.

A test-tube is immersed in water.

Teacher. Well, this tube does not sink. It is not its weight, but its shape. How could you make this test-tube sink?

Pupil. Turn it upside down.

Demonstration shows that test-tube upside down does not sink.

Pupil. Fill it with water.

Demonstration. Tube still floats.

Teacher. You can do the same thing with a ship, but it will sink long before it is full of water. Now we shall put some lead shot into this tube. I want to get it just floating. Do you think it is possible?

Pupil. The mass of one iron pellet might make all the difference.

Teacher. Just like buying sweeties out of a shop. You know how the shopkeeper takes one off or adds one until he gives you the proper weight. Now, I am adding more and more shot. What am I doing to its weight?

Pupil. Making it greater.

Teacher. And when is it going to sink?

Pupil. When the density of the whole test-tube is greater than the density of the water.

Teacher. And what is the density of water?

Pupil. One gm. per c.c.

Demonstration of test-tube floating.

Teacher. What does that mean?

Pupil. It means that the density of the whole test-tube is equal to that of the water.

Teacher. Well, here, look at the tube now. I have taken the cork out a little. It is sinking. Its density must be greater. Here is a stone. Look, it floats!

Pupil. That's pumice-stone. It floats because it is less dense than water.

Teacher. Yes. Now I wonder what we can do to a cork to make it sink?

Pupil. Make its density more.

Teacher. How will I do that?

Pupil. Tie a sinker to it.

Experiment with cork and metal cube.

Teacher. The cork floats because it is less dense than water: the cube sinks because it is denser. Look at this. I have put a sinker on it and it still floats. What's happened?

Pupil. The density of the cork takes up more volume. The weight is not heavy enough to sink the cork.

Teacher. Yes, that's right. You have to think of this as one single thing. If you put too much cargo on to a ship, the ship will sink. In this case you have not put on a heavy enough load to make the cork sink. But it was an aluminium cube we put on! Have you any idea what this cube will weigh? Well, it weighs round about 40 gm. The cork is about 10 gm. What is the combined mass?

Pupil. Round about 50 gm.

Teacher. What will we know about its volume then? We shall know that the combined cube and cork float because they are less dense than water. What is the density of water?

Pupil. One gm. per c.c.

Teacher. Supposing it is just floating and no more. Its mass is 50 gm. Its volume must be slightly more than fifty if

it floats. Look how the water pushes up this cork. There are two forces at work—water and air. The water exerts its force upwards. If the upward force is greater than the weight of the cork, it is pushed up. If it goes downward it means that the force of gravity is the same as the force of the water. If this test-tube is just floating, it means that there is a force up and a force down that must be equal. Let us take a measuring-glass and put some water into it. Put a tube in. What do you notice happening?

Pupil. The water rises.

Teacher. Suppose we take a reading. It is 65 c.c. Now let us put in the tube again. Now then, it is just floating at ninety-eight. What is that?

Pupil. The volume of water displaced by the whole thing.

Teacher. Now then, here is another one. What do we get from it?

Pupil. The density of one is greater than the density of the other.

Teacher. Now then, I want to see if there is any connection between the amount of water displaced and the weights. This tube, the heavier one, displaced more water than the lighter one. I want to see if there is any connection between that and its weight. Put some water into a measuring-glass and take a reading. Then, lowering your tube, find the volume of water displaced. Then I want you to weigh a loaded test-tube, and take a reading on the measuring-glass. See that it is floating. You cannot have it hitting the bottom if you want to take a reading. If you subtract it from what you got before, you will find the mass of water displaced.

Working in teams, the boys start an experiment "to see if there is any relation between the weight of a floating body and the weight of the fluid it displaces."

The boys start by getting test-tubes, which they weigh on

balance pans. The tubes are suspended from the hook on the balance pans.

QUESTIONS AND EXERCISES

1. What type of reasoning is chiefly used in this lesson? Justify your answer.

2. What kinds of help does the teacher give the class towards the solution of the problem? Do you consider that the help given prevents the class from doing independent thinking? Give reasons.

3. The teacher's main aim in this lesson is not to teach the principle of flotation as a piece of scientific information, but to train the class in scientific thinking. In what particular habits of scientific thinking does he give them practice?

4. Why was it better for the teacher not to give any opinion on the four hypotheses first suggested (p. 113, ll. 5-9), even when one of these was obviously irrelevant?

5. When a pupil finally states the correct reason for the cork floating (p. 115, l. 9), the teacher does not at once say that it is correct. Do you approve or disapprove of this procedure? Why?

6. Reeves, *Standards for High School Teaching* (pp. 157-8), distinguishes four forms of reasoning in classroom work: (a) individual; (b) group; (c) following the teacher's reasoning; (d) following the reasoning in a book. Which of these forms was used in this lesson? What would have been the chief disadvantages of the other forms? Which form would be most appropriate for a first presentation of a difficult new proposition in geometry to an average class?

XIII

PHYSICS—EXPANSION OF LIQUIDS

CLASS: First-year (age 11-12) of 20 pupils (boys and girls)

Teacher. In our last experiment we found that when we heated metal it——

Pupil. Expanded.

Teacher. What does expanded mean?

Pupil. It got bigger.

Teacher. What happened when it was cooling?

Pupil. It contracted.

Teacher. What is contracted?

Pupil. It goes smaller.

Teacher. What experiment showed that it had expanded in all directions?

Pupil. It was termed the ball-and-ring experiment.

Teacher. You started by passing the ball through the ring. After that what did you do with the ball?

Pupil. Heated it.

Teacher. And then could you draw the ball through the ring?

Pupil. No.

Teacher. Why?

Pupil. It had expanded.

Teacher. In what direction ?

Pupil. In all directions. Metal expands in all directions when it is heated. It contracts in all directions when it is cooling.

Teacher. Yes, what are the three states of matter ?

Pupil. Liquids, solids, and gases.

Teacher. The three states are solids, liquids, and gases. We have discovered that a solid expands when it is heated and contracts when it is cooling. What do you take next ?

Pupil. A liquid.

Teacher. Where do you get some water from ?

Pupil. From the tap.

Teacher. And where do you get water most ?

Pupil. From the sea.

Teacher. Well (taking some water from the tap), here is some water. What is the colour of it ?

Pupil. It is colourless.

Teacher. Well, if we want to see what is going to happen to it when it is heated, what will we have to do with it ?

Pupil. Put dye into it.

Teacher. Yes, put something in it. The substance we will use are red crystals, and are called Potassium permanganate, and you will know it much better under the name that it gets when you have mixed the red crystals in water. It is a deep red colour. Who knows it ? You use it to gargle your throat.

Pupil. Condy's crystals.

Teacher. Yes, you call this substance Condy's fluid, but you

need not try to remember that. You are simply to remember it is coloured water. Now we will fill a flask with it. You see the stuff going into the flask pushes some of the liquid upwards into the tube here. We will now mark the level of the liquid.

Proceeds with the experiment.

Teacher continues : Now, remember that mark and watch it very carefully. We will now treat the liquid with heat. What will we use to do that ?

Pupil. A Bunsen.

Teacher. What will be used in it ?

Pupil. Gas.

Teacher. What is the substance in the Bunsen burner ?

Pupil. Coal-gas and air.

Teacher. Now look. What is happening to the level of the water ?

Pupil. It is going down.

Teacher. Watch it. What is happening now ?

Pupil. It is going up.

Teacher. Now we have stopped heating. What's the liquid doing ?

Pupil. It has stopped.

Teacher. What is it going to do now ?

Pupil. It is going down.

Teacher. Now we will take the fundamental thing. If the liquid in the flask rises up that tube, what must it be doing ?

Pupil. Expanding.

Teacher. If we stop heating and the liquid goes down, what is it doing ?

Pupil. Contracting.

Teacher. Yes, liquid expands when it is heated. What does it do when it is cooled?

Pupil. Contracts.

Teacher. Yes, a liquid expands when heated; a liquid contracts when cooled. What does exactly the same?

Pupil. A solid.

Teacher. Now, so far as this experiment is concerned, what are the two things you are heating?

Pupil. The liquid and the flask.

Teacher. Yes, both were being heated. What will happen to the glass of the flask when heated?

Pupil. It expands.

Teacher. Yes, it expands. But what is happening to the liquid?

Pupil. It expands too.

Teacher. Which will get heated first?

Pupil. The flask.

Teacher. Yes, if the flask expands there will be more room in it. What will happen to the liquid inside?

Pupil. It goes down further.

Teacher. Once you have started heating, and the liquid starts to expand, what happens to the level?

Pupil. It rises.

Teacher. Take it the other way. You start to let it cool.

Pupil. The level starts to fall.

Teacher. What is it that causes it to fall?

Pupil. The liquid contracting.

Teacher. Yes, now what happens to the liquid when it is heated?

Pupil. It expands.

Teacher. What happens when it is cooled?

Pupil. It contracts.

Teacher. Yes, and therefore we find that when liquid is heated it expands, and when cooled it contracts. Now the water is falling. What is happening?

Pupil. It is cooling.

Teacher. Yes, water does two things. It heats slowly and cools slowly. Look at the British Isles. The water round them takes longer to heat than the land, but when it is cooling, in the winter, it takes longer to cool than the land. If the water takes longer to heat than the land in summer and longer to cool, what sort of climate have we?

Pupil. It is not too hot in summer, and not too cold in winter.

Teacher. Yes, and what do you call that?

Pupil. A maritime climate.

Teacher. Here is a circle that shows you¹¹². The circle I am drawing is the land. In summer the land is getting heated up by the sun. What happens?

Pupil. The sea is taking longer to heat, and so it prevents it becoming too hot.

Teacher. Yes, therefore it keeps the land from getting too hot. In winter, when the land is colder, the sea is taking longer to cool, and so keeps the land from becoming too cold. Give me two times of the year when the sea is just as hot as land.

Pupil. The end of summer and the beginning of winter.

Teacher. What are the other names?

Pupil. Spring and autumn.

Teacher. Yes, remember the reason that keeps the land from becoming too warm or too cold.

Proceeds with the experiment.

Teacher continues. Well, take this flask. Supposing the liquid in it rose an inch with the heat that was applied, how much would it rise if I heated it twice as much?

Pupil. Two inches.

Teacher. Three times?

Pupil. Three inches.

Teacher. The first time it goes up one inch; the second time two inches. How many times more have I heated it?

Pupil. Twice.

Teacher. Suppose it rises three inches. How many times have I heated it more than the first time?

Pupil. Three times.

Teacher. Well, suppose I am asked if this room is warmer than the one next door, how am I going to find out?

Pupil. Take the flask into the next room, and see what happens to the level.

Teacher. Well, suppose I take it next door and find that the level rises. What has happened?

Pupil. The room next door is warmer than this one.

Teacher. And if the level falls, what has happened?

Pupil. It is colder in there than here.

Teacher. Very well, then. I can take this flask about with me and find if it is hotter or colder. Can you imagine me doing that? It is not very handy. What should I do?

Pupil. Get a thermometer.

Teacher. What is a thermometer?

Pupil. Something for judging the temperature of a room.

Teacher. Well, is this flask a thermometer?

Pupil. Yes.

Teacher. But the only difference between this flask and a thermometer is in size. Both tell you how cold a room is or how warm it is, but the flask is not so handy for carrying about. Now, what does a thermometer give you?

Pupil. Temperature.

Teacher. What does a high thermometer mean?

Pupil. It is hot.

Teacher. And a low thermometer?

Pupil. It is cold.

Teacher. Well, then, all we have to do if we want to carry a thermometer about is just to reduce its size.

QUESTIONS AND EXERCISES

Note.—The lesson occupied two periods, but only a section of the complete report is given, representing the first thirty minutes of the lesson.

1. Examine the questions asked. Classify them as either "thought questions," i.e. involving an element of judgment on the part of the pupils, or "fact questions," i.e. involving mainly recall of information already known. Justify or criticise the proportion of thought to fact questions.

2. What is the nature and purpose of the first ten questions?
3. The part of lesson reported here occupied thirty minutes. Count the total number of questions and answers given during that time and calculate the number of questions and answers per minute. Do you consider this too many or too few? Why? (Cp. Waples, *Procedures in High School Teaching*, pp. 111-14.)
4. Read the sequence of questions and answers from p. 123, l. 8, to p. 123, l. 21. What would be the advantages and/or disadvantages of substituting for this sequence one thought-question such as, "Did you notice that when we started to heat the flask the level of the liquid fell slightly before it started to rise? Can anyone suggest a reason for this happening?" How long would you give the pupils to think before taking answers to this question?
5. The statement (p. 124, ll. 11-12), "Water heats slowly and cools slowly" does not follow from the experiment performed. Would you have excluded it from the lesson because of this? Give reasons. Give any other example from the report of irrelevant matter being introduced and consider whether it can be justified.
6. Would it have been preferable for the pupils to have done this experiment for themselves instead of the teacher giving a demonstration? Give reasons for and against, and try to lay down the circumstances when the demonstration is preferable to individual experiment. (Cp. Reeves, *Standards for High School Teaching*, pp. 259-63, 357-8.)
7. Make a general comparison of this lesson with the previous lesson on flotation. What differences do you find in their respective treatments? To what are the differences due?

XIV

ARITHMETIC—PROFIT AND LOSS

CLASS: Second-year (age 12-13), 28 girls

Teacher. Supposing when you leave school, you were lucky enough to have the choice of two situations. What would guide you? Which one would you take?

Pupil. The one you could do best.

Teacher. Splendid. That would be a good way to look at it. And would you not think of the money?

Pupil. Yes.

Pupil. I would take the job I knew most about.

Pupil. I would go and work for somebody.

Teacher. That means you are going into a situation where you would work for an employer, who would give you money for working at the end of the week. What do you call that?

Pupil. Your pay.

Teacher. Yes, so every week you know what you are getting. If you do well, you get a little more. But suppose you say, "I don't want to work for somebody; I want a shop of my own." Perhaps you start a milliner's shop in Gorgie here and sell dresses. Now, who pays for the dresses you sell? You have to buy them from somewhere, and, of course, you have to get money to live on. Where do you get it?

Pupil. From your customers.

Teacher. Well, suppose I see a nice dress and go into the shop and say, "There is a pound note," and buy it. I pay a pound for the frock, which has not cost the shopkeeper a pound. What do you call that?

Pupil. Profit.

Teacher. What do you mean by the profit? I pay a pound for a frock that has cost you 14s. What is going into your pocket?

Pupil. The difference between what you get and what you paid for it.

Teacher. Then it is the 6s. which is going into your pocket. But if you have a shop like this, will you be like the other girl who is working for an employer? Will you know how much you will be getting each week?

Pupil. No.

Teacher. What will it depend on?

Pupil. The amount of frocks you sell and the prices you have sold them at.

Teacher. Quite right. But where would you get the frock you want to sell in your shop? Do you go and get it from another draper's shop? Where do you buy it?

Pupil. In Glasgow.

Pupil. In the place where they make frocks.

Pupil. From a merchant.

Teacher. But what is a merchant?

Pupil. A man who sells groceries.

Teacher. Well, is she not a merchant? Like a man who sells groceries, she sells things such as frocks, and they call her a draper. Where does she buy her frocks from?

Pupil. The wholesale.

Teacher. Well, she really gets her frocks from a warehouse, but what sort of a warehouse do you call it?

Pupil. A wholesale warehouse.

Teacher. Yes, she gets it from a wholesale warehouse. But where does the warehouse get the frocks from? What do you call a place where they make things?

Pupil. A factory.

Teacher. Yes, that's what you call the place they make things. Well, we were talking of a merchant. What is it a merchant sells that is not grown in this country?

Pupil. Tea.

Teacher. Yes, tea. We get it from China. They export it and we import it. It comes from China in ships into Leith. People who order the tea—they are called wholesalers—collect it at Leith, and store it in big houses which we call warehouses. If you are a merchant and want some tea, you get it from the warehouse. It is the place where the supplies that a merchant needs are kept. The factory is the place where things are made. If you were dealing in rubber bottles and things like that, where would you go if you needed some for your shop?

Pupil. To the rubber mills.

Teacher. Yes, the rubber mills in Fountainbridge. That is a factory. Suppose you deal in woollen goods. Where do you go—to a warehouse or a factory?

Pupil. To a factory.

Teacher. You would not go to China for them. What do they send us from China?

Pupil. Dishes.

Teacher. I was thinking of things to wear.

Pupil. Silk.

Teacher. Yes, China silk. But getting back to this, we have our factories and our warehouses. If I wanted woven or tweed articles, where would I go in Scotland?

Pupil. To the Borders.

Teacher. Now about this word wholesale. Can you apply it to the factories too?

Pupil. Yes.

Teacher. Well, suppose I wanted one cardigan and one jersey and went to a factory in Galashiels, do you think they would supply me? What would they say?

Pupil. They would say, "You must buy a lot of things at once. You must buy wholesale."

Teacher. Yes, so we can say that buying wholesale means buying a lot of goods at once. I will tell you a little story about that. Once two friends of mine who were living in lodgings in Edinburgh heard that they could get good fruit cheap at the Waverley Market. They went round Market Street—you know where that is—and were asked at the door of the Market what they wanted. They said they wanted bananas. They were taken up to an office, where a gentleman was sitting, and when they told him that they wanted bananas he said, "Well, and how many crates would you like?" (*laughter*). They said that they had come to buy only half a dozen bananas. He told them he would let them have that number as a present, though he sold bananas only wholesale. Now how did my friends want to buy?

Pupil. They wanted to buy retail.

Teacher. Yes, and what do we mean by retail?

Pupil. To buy in small quantities.

Teacher. Yes, it is just the same as if you wanted to buy a reel. You would go up the street into some shop and get it. Can you imagine going into a factory and asking for one reel? Now, before you can buy from a factory, you must show your credentials. What do you mean by that?

Pupil. You must show that you have a licence for a shop.

Teacher. It really means that you must be able to show them that you are a shopkeeper.

Teacher. Now, what advantage do you get from buying wholesale?

Pupil. You get them cheaper if you buy more.

Teacher. Yes, but you must buy a large number of frocks. The shopkeeper gets them and sells them for more than she paid for them. How does she live?

Pupil. By profit.

Teacher. Yes, the difference between selling price and buying price. Can you call buying price by another name?

Pupil. Cost price.

Teacher. And what is the other name?

Pupil. Wholesale price.

Teacher. So there are three names. She can call her selling price my buying price, and if she buys in large quantities she can speak of buying wholesale. Supposing she bought a frock for 14s. and sold it for £1, is that a good profit?

Pupil. Six shillings; yes.

Teacher. Now I am going to ask you this question. It is a funny question. What did she "lay out"?

Pupil. Fourteen shillings.

Teacher. And what did she take in?

Pupil. One pound.

Teacher. So she took in £1 for a frock on which she had laid out 14s. In other words, she earned six shillings on 14s. Say if Janet here bought a more expensive frock at £1 10s. and wanted to sell it in her shop? What do you think would be a good selling price?

Pupil. Two pounds ten.

Teacher. She takes a good price at any rate. What has she earned?

Pupil. One pound.

Teacher. Some other day Janet might say, "I bought that frock at 15s., but I don't think people like it very much, so I will sell it for £1. She is getting a profit of 5s., but if she goes on in that haphazard way she will never know how she stands and how she is getting on. Out of the five shillings' profit she has made, she has to pay a lot of expenses in connection with her shop. She has rent, taxes, light, coal, carriage of her goods, cleaning, and a whole lot of other things as well as the wages she has to pay to her assistant. She has got to consider all those things. Moreover, she has got to consider that there may be other people in the same street dealing with the same wholesale warehouse who are selling the goods in their shops for less. What would happen if that was the case?

Pupil. The other people would get all the business.

Teacher. So Janet will first have to make her prices the same as the other people, but she will also need to see that she gets back the money she lays out along with enough to pay all her expenses. She bought a frock for 15s. and sold it for £1. How much did she get back?

Pupil. Five shillings.

Teacher. Yes, but what fraction of the 15s. she paid for frock is five shillings?

Pupil. One-third.

Teacher. Well, that means she got one-third profit. In her ordinary daily business life she says, "One-third profit will do me." So suppose she buys something at 6d., how much will she sell it for?

Pupil. Ninepence.

Teacher. Are you sure? My arithmetic must be wrong if you are right.

Pupil. Eightpence.

Teacher. Buying price: 6d. One-third of sixpence is 2d., so she sells it for eightpence. One-third is what people might call a fair, honest profit, and they know that if they exceed it, the other shops in the district will get the business.

Suppose Janet buys something at 1s., what will she sell it for?

Pupil. 1s. 2d.

Pupil. 1s. 4d.

Teacher. Yes. Buying price, 1s. A third of that is 4d. So she sells it for 1s. 4d. So it means that her selling price is her buying or cost price, plus one-third profit.

Teacher. If she buys an article at £1 10s., what will she sell it for?

Pupil. £2.

Teacher. Well, let us take a place like Princes Street, where the shopkeepers have to pay much bigger rents. If their rents are heavy, what will their dresses be?

Pupil. Heavy too.

Teacher. I was referring to the price of them (*laughter*). In Princes Street, where their expenses are heavy they may say, "We must have one-half profit." So if they bought an article

for £3, how much would they want for it before they would sell it?

Pupil. £4 10s.

Teacher. Yes, and how much would they want for an article that had cost them £5?

Pupil. £7 10s.

Teacher. Well, I am going to talk of another thing. Do you know what "per cent." means?

Pupil. Yes, something out of a hundred.

Teacher. Well, in Princes Street a merchant might tell his assistants to charge 50 per cent. profit on the things they sold. They would speak of 50 per cent. in the shop, but they know it means half of the cost price of the article.

Teacher. Suppose I want to be a profiteer. I buy a thing at £6 and want 75 per cent. profit. What will I sell at?

Pupil. £10 10s.

Teacher. Take it the other way round. I bought a thing at 1s. and sold it at 1s. 3d. What profit have I made?

Pupil. Twenty-five per cent.

Teacher. Well, I made up my mind that I was going to be content with one-third profit, so I always speak of $33\frac{1}{3}$ per cent. The wholesale price of an article is 1s. 6d., and I always take $33\frac{1}{3}$ per cent. What do I mark the selling price at?

Pupil. 1s. 9d.

Teacher. What is $33\frac{1}{3}$ per cent.?

Pupil. A third.

Teacher. Well, now give me a third of 1s. 6d. What is a third of 1s.?

Pupil. Fourpence.

Teacher. And a third of sixpence?

Pupil. Twopence.

Teacher. Well, what is the answer to a third of 1s. 6d.?

Pupil. Sixpence.

Teacher. Then what is the selling price of the article which cost 1s. 6d.?

Pupil. Two shillings.

Teacher. Yes. Well, supposing I am in a country shop. The rent is not so high and the expenses are not so heavy, and I don't want to make such a large profit. Sometimes it is better to have a lower profit, because you have a bigger turnover. What do I mean by turnover?

Pupil. You might sell far more things.

Pupil. You might get more customers than you expected.

Teacher. Well, you are not explaining it to me. Sometimes you might hear one business man saying to another: "I had a good turnover last week." He means by that that he had good sales. He sells so much one day, and so much the next, and at the end of the week he adds them up. He knows by his sales how much he has made. His turnover is the amount of money he has drawn in. What is your opinion of a good turnover in a Gorgie shop for a week?

Pupil. £50.

Teacher. Well, £50 is my turnover for the week. See if you can tell me my profit for the whole week at $33\frac{1}{3}$ per cent.

Pupil. £16 13s. 4d.

Teacher. Yes, all you have to do is to divide £50 by three. Would you be satisfied with that profit?

Pupil. Yes, I think I would.

Teacher. But off that sum you would have to meet your expenses, say, £6 13s. 4d. That would leave you with a profit of £10 per week or £520 a year. I think I would be satisfied with that. I would have a motor-car (*laughter*). So what do we mean by turnover?

Pupil. The amount of money that comes in every week.

Teacher. Take it this way; call it total sales. But remember a merchant usually speaks about his turnover for the week being good or bad instead of saying his total sales were good or bad.

QUESTIONS AND EXERCISES

1. Make an outline (as for a lesson plan) of the main points taught during the period. From the outline, what would you say was the teacher's particular aim in this first lesson on profit and loss? Discuss the suitability of this aim for (a) a class of girls having one or two more years of school life still to come; (b) a class taking the full secondary school course.

2. Consulting your outline, determine how many of the main points of the lesson were elicited from the class by questioning. What are the advantages and disadvantages of this procedure? Give concrete illustrations from the report of each advantage or disadvantage.

3. What are the outstanding good points of this lesson? Suggest any corresponding weaknesses which, in less skilful hands, might accompany these merits.

4. "Digressions are often the most valuable part of a lesson." Discuss this statement and consider the value of the digressions in this lesson.

5. The interest of the pupils was maintained at a very high level throughout the period. Make a list of the means by which this was achieved, referring to parts of the report to illustrate each point. Express these methods in general terms so that you might apply them to a lesson of your own. Was the interest of the "sugar coating" type, or was it inherent in the material of the lesson?

XV
ARITHMETIC—POSITIVE AND NEGATIVE
NUMBERS

CLASS: First-year (age 11-12), 34 girls

Teacher. We are going to revise positive and negative numbers right from the beginning. You are all familiar with an ordinary ruler. On it you know the numbers are spaced evenly and they always move from left to right. These numbers actually exist. Now, when you are perfectly certain of anything there is a word you use to describe it. What is that?

Pupil. Positive.

Teacher. So your numbers are called positive numbers. Now a positive number you just write as a number itself. You are quite sure it exists. When you place the numbers alongside each other, we get what we call the natural scale of numbers. Now there is a peculiarity of a ruler that is rather interesting. Do you ever realise that you can add automatically with a couple of rulers? I want to show you that. Unfortunately, I don't have very big rulers here.

Demonstration.

Teacher. These two rulers have the scale the same size. Suppose I want to add 3 and 4. When you are writing that, what do you start with?

Pupil. Three.

Teacher. Yes, so there is your starting-point. We add 4. I place this ruler alongside here, and there is your answer. It is 7, and you have worked it out automatically. Here is another: $2 + 3$. Where are you going to start?

Pupil. Start at 2 and go along 3.

Teacher. Right. You must always go along to the right. You start at number 2 and go along 3 to the right, which gives you 5. Then we have $5 + 6$, which, by the same method, gives us 11. Now look at this: $5 + 6$. What are you adding?

Pupil. A positive.

Teacher. Well, to add a positive, your first rule is to go to the right. Now take this one: $8 - 3$. What are you doing here?

Pupil. Subtracting a positive.

Teacher. Now, you remember the rule: To add a positive you go to the right; to subtract a positive, go to the left. If you think of your ruler or natural scale, you have no difficulty with positive numbers.

Pupils repeat the rules.

Teacher. Now, here is one: $4 - 5$. What will we do?

Pupil. Start at 4 and go 5 places to the left.

Teacher. Well, we will have to extend our natural scale if we are going to do that.

Demonstration extending numbers to the left of 0 on the natural scale.

Teacher. Well, we have these numbers to the left which are less than nothing. Such numbers don't exist in ordinary life—you can't get one less than nothing books—so I have to get a word which expresses it. What is the opposite of a positive number?

Pupil. A negative number.

Teacher. And so to distinguish them from the positive numbers we put minus in front of them, but I want you to get into the habit of calling them negative numbers—negative 1,

negative 2, negative 3, and so on. And so we call this the extended scale. Let us do this one: $4 - 5$.

Pupil. Start at 4 and go 5 to the left.

Teacher. Yes, and your answer is minus 1.

Pupils provide answers to examples put on board by teacher.

Teacher. Well, to add a positive ?

Pupil. You go to the right.

Teacher. And to subtract a positive ?

Pupil. You go to the left.

Teacher. And to add a negative go to the left. But I will have to show you how this happens. Take this one: $4 + - 5$. We must not leave those two signs together or we shall get confused, and so we put a bracket and make it $4 + (- 5)$.

You don't know how to add a negative yet. You are just judging from the rule. Supposing I have a set of numbers does it matter what order they are in ?

Pupil. No.

Teacher. Well, you start at negative 5 and go 4 to the right. What is the answer ?

Pupil. Minus 1.

Teacher. $(- 9) + 6$. What is the operation here ?

Pupil. Adding a positive. The answer is minus 3.

Teacher. Tell me the answer to this one: $4 + (- 2)$.

Pupil. Positive 2.

Teacher. To add a negative is exactly the same as subtracting a positive. What do you call this position on the left compared with this on the right ?

Pupil. They correspond.

Teacher. Well, the rule is: To add a negative, subtract the corresponding positive. Instead of working with a negative, we have turned it round in such a way that we now are working with a positive. But we know what we do with a positive. To add that we go to the right, and to subtract we go to the left. Now, we shall just do two examples:

$$\begin{aligned} 7 + (-4) \\ 7 - 4 \\ = 3 \end{aligned}$$

You see how easy it is if you put your negatives into positives.

$$8 + (-12)$$

To add the negative you subtract the corresponding positive:

$$\begin{aligned} 8 - 12 \\ = -4 \end{aligned}$$

So we have learned that:

To add a negative, subtract the corresponding positive.

To subtract a negative, add the corresponding positive.

Look at this. Here is a set of numbers put down in a definite fashion:

$$\begin{aligned} 4 - 4 &= 0 \\ 4 - 3 &= 1 \\ 4 - 2 &= 2 \\ 4 - 1 &= 3 \\ 4 - 0 &= 4 \end{aligned}$$

A set of numbers in Mathematics is called a series. What is the law of formation?

Pupil. You add 1 each time.

Teacher. Then take 7, 6, 5, 4, 3, 2, 1. What are you doing?

Pupil. Subtracting one each time.

Teacher. If you have a series in which the terms of one series is equal to another series, then they will be equal.

QUESTIONS AND EXERCISES

1. What is the particular value of the ruler illustration in introducing the idea of positive and negative numbers? With a class of bright pupils, would you still consider it necessary to use this illustration:

- (a) In a first treatment of the topic;
- (b) In a second presentation?

Why, or why not?

2. Note especially the pupils' answers. Which two of the following seem to describe most accurately the pupils' mental processes during this period?

- (a) Deductive reasoning.
- (b) Following the chain of the teacher's reasoning.
- (c) Inductive reasoning.
- (d) Drill application of rules.
- (e) Memorising.

What is the special usefulness of the combination used?

3. P. 140, ll. 6-9. What principle is involved in the repetition of the rules after they have already been explained and drilled? Find another example of this same principle later in the lesson. Summarise briefly this teacher's steps in teaching a new rule, e.g. p. 140, l. 10—p. 141, l. 2. Note especially the number of statements of the rule and where they come. Discuss the value of each repetition, noting slight differences in the wording.

4. The report of the lesson is unfinished. Write out questions and answers to complete the presentation and drill of the rule "To subtract a negative add the corresponding positive" in a similar manner to that used in the case of the other rules.

5. State in detail how you would try to consolidate this period's work in (say) ten minutes at the beginning of the next period.

XVI

ALGEBRA—SIMPLE EQUATIONS

CLASS: First-year (age 11-12) of 41 pupils (boys and girls)

Teacher. $x + 3 = 6$. What name do you give to a statement like that? Something with equals in the middle and something on each side.

Pupil. An equation.

Teacher. An equation therefore consists of two sides and something inside. What do you do to solve that equation?

Pupil. See what x equals. x equals 3.

Teacher. What do you put in front?

Pupil. Three dots meaning therefore.

Teacher. It is because this is true that this is true. What did you do with the 3?

Pupil. You changed it from plus.

Teacher. Therefore the first rule of an equation is——

Pupil. If you change the side you must change the sign.

Teacher. Yes, you take the 3 to the other side and plus 3 becomes minus 3.

Teacher. Now do this one:

$$x - 7 = 4$$

What do you want to be left with on the other side? What is the thing that keeps x from becoming 4?

Pupil. The 7.

Teacher. Very well:

$$x = 4 + 7$$

$$x = 11$$

Suppose, on the other hand, you get it like this:

$$3x - 7 = 8$$

What is the first step?

Pupil. Take the 7 over to the other side.

Teacher. Yes, therefore:

$$3x = 8 + 7$$

$$3x = 15$$

That is the same thing as we did before. How are you going to get the value of x ?

Pupil. 3 into 15.

Teacher. What are you doing?

Pupil. Dividing 15 by 3.

Teacher. Therefore:

$$x = 5$$

What did you do to both sides of the equation?

Pupil. Divide by 3.

Teacher. So that gives you your second rule: Divide both sides by the same thing.

Teacher. Now do this sum:

$$5x + 2 = 12$$

What is the first step?

Pupil. $5x = 12 - 2$.

Teacher. Yes, what rule is being applied in that case?

Pupil. The first rule: Change the side, change the sign.

Teacher. Therefore:

$$\begin{aligned}5x &= 10 \\ x &= 2\end{aligned}$$

What did you divide both sides by that time?

Pupil. By 5.

Teacher. Yes. Suppose, instead, you have this equation:

$$\frac{1}{2}x = 3$$

What other way can you write that?

Pupil. x upon 2.

Teacher. If $\frac{1}{2}x$ equals 3, what will the whole of x equal?

Pupil. x will be equal to 6.

Teacher. If $\frac{1}{4}x$ equals 2, what will the whole of x equal?

Pupil. 8.

Teacher. Good: $x = 8$.

Take this one: $\frac{2}{3}x = 6$. What does x equal?

Pupil. x equals 9.

Teacher. Tell me how you arrive at it.

Pupil. Three times three.

Teacher. I can see one 3, but where does the other one come from?

Pupil. 2 into 6.

Teacher. Now there are two steps there quite definitely. You said 2 into 6 and you got 3, and then you said three times three. What were you doing to both sides?

Pupil. Multiplying both sides by 3.

Teacher. Then what do you do to both sides of an equation?

Pupil. Multiply both sides by the same thing.

Teacher. Yes, when you know these rules thoroughly, and when you can apply them, you will be able to solve any equation I can give you. Those are the most important rules in equations. Let us see this one:

$$\frac{2}{3}x = 6$$

By what do you multiply both sides of the equation?

Pupil. By 3.

Teacher. What is $\frac{2}{3}$ multiplied by 3?

Pupil. One and a third.

Teacher. What! Tell me what it is (to another pupil).

Pupil. 2.

Teacher. How did you get it?

Pupil. By cancelling the 3's.

Teacher. What is $\frac{2}{4}$ multiplied by 4?

Pupil. 3.

Teacher. If you have a number like $\frac{2}{3}$, and you want to get rid of the denominator 3, what you do is to multiply by whatever your denominator is, and your denominator disappears. If you multiply the right-hand side of this equation by 3, what must you do to the left-hand side?

Pupil. Multiply by 3.

Teacher. Therefore:

$$\begin{aligned}\frac{2}{3}x &= 6 \\ 2x &= 18 \\ x &= 9\end{aligned}$$

Now suppose you take $\frac{3}{4}x = 9$. See if you can give me the answer.

Pupil. x equals 12.

Teacher. Let us look at it. What do you multiply both sides by?

Pupil. By 4.

Teacher. Multiply both sides by 4. What do you get when you multiply $\frac{3}{4}x$ by 4?

Pupil. 3.

Teacher. Then multiply $\frac{3}{4}x$ by 4 and what do you get?

Pupil. $3x$.

Teacher. If you multiply the left-hand side by 4, what must you do to the right-hand side?

Pupil. Multiply by 4.

Teacher. Yes, therefore:

$$\begin{aligned}\frac{3}{4}x &= 9 \\ 3x &= 36 \\ x &= 12\end{aligned}$$

Now suppose you have an equation like this:

$$\frac{2}{3}x - \frac{3}{4} = \frac{1}{2}x + \frac{2}{3}$$

You have done equations before with all x 's. What did you do with them?

Pupil. Take them to the left-hand side. Then you take all your numbers to the right-hand side.

Teacher. Right; we will just follow out this rule, and so the next line is:

$$\frac{2}{3}x - \frac{1}{2}x = \frac{2}{3} + \frac{3}{4}$$

Now the question arises, what is $\frac{2}{3}x - \frac{1}{2}x$? We had better find out what is $\frac{2}{3} - \frac{1}{2}$. What number do we put down for the L.C.M.?

Pupil. 6.

Teacher. Very well; therefore:

$$\frac{4-3}{6}$$

$$= \frac{1}{6}$$

Therefore:

$$\frac{1}{6}x = \frac{8+9}{12}$$

Therefore:

$$\frac{1}{6}x = \frac{17}{12}$$

What will we have to multiply by in order to get x ?

Pupil. Multiply both sides by 6.

Teacher. What is $\frac{1}{6}$ multiplied by 6?

Pupil. One.

Teacher. Therefore $\frac{1}{6}x$ multiplied by 6 is:

$$x = \frac{17}{12} \times \frac{6}{1}$$

$$x = \frac{17}{2}$$

$$x = 8\frac{1}{2}$$

That is following out your rules and then bringing those fractions together. Look at that equation again. Look at all those factors. Can you think of any number that would get rid of the 2, 3, 4 all at the one time?

Pupil. 12.

Teacher. There is not any rule to say that you must wait till the end of your equation till you multiply. Therefore:

$$\frac{2}{3}x - \frac{3}{4} = \frac{1}{2}x + \frac{2}{3}$$

We will multiply this by 12. Therefore:

$$8x - 9 = 6x + 8$$

You have seen an equation like that before. What is the coefficient of x ?

Pupil. The number that goes in front of it.

Teacher. Yes, so we have changed the coefficient of x at once by getting rid of the fractions. What is the next thing we have to do to solve the equation?

Pupil. Take the x 's to one side and the numbers to the other.

Teacher. Yes, therefore:

$$\begin{array}{rcl} 8x - 6x & = & 8 + 9 \\ 2x & = & 17 \\ x & = & 8\frac{1}{2} \end{array}$$

Which method is simpler?

Pupil. The second one.

Teacher. Yes, the advantage of it is that you get rid of your fractions at once. Multiply both sides by 12 and so your fractions disappear. If they don't, you have not chosen the right number. Let us do this one:

$$\frac{3}{4}x - \frac{1}{2} = \frac{5}{16}x + \frac{7}{8}$$

What can we multiply both sides by?

Pupil. By 16.

Teacher. Very well, therefore:

$$\begin{array}{rcl} 12x - 8 & = & 5x + 14 \\ 12x - 5x & = & 14 + 8 \\ 7x & = & 22 \\ x & = & 3\frac{1}{7} \end{array}$$

Now in your jotters take this one:

$$\frac{1}{2}x - \frac{1}{4} = \frac{1}{4}x + \frac{1}{2}$$

The first thing to get is what you multiply both sides by. Once you get that, the rest is plain sailing. (Pupils work on jotters.) Now I will put it down on the board. What do you multiply both sides by?

Pupil. By 4.

Teacher. Yes, by 4. Therefore:

$$2x - 1 = x + 2$$

$$2x - x = 2 + 1$$

$$x = 3$$

How many got that right? (Ninety per cent. of the class hold up their hands.) Hands up those who multiplied by 8. Several hands went up, whereupon the teacher remarked: "That was unnecessary work."

In the few minutes that remained before the end of the period, the teacher gave the pupils oral practice in simple multiplication.

QUESTIONS AND EXERCISES

1. The "advance step" in this lesson was to teach the fractional coefficient. Consider the presentation of this new rule (p. 145, l. 6 onwards) as an example of proceeding from the simple to the complex. Write down the examples used in order. How many stages of difficulty are represented? Should more examples have been used at any stage? Why?

2. Would it have been an improvement to have introduced the new rule ("Multiply both sides by the same thing," p. 146, l. 1) after the example $\frac{1}{2} \times$ (p. 145, l. 14) rather than after the example $\frac{2}{3} \times - 6$? If so, what advantage would be gained?

3. On what grounds do you approve or disapprove of the teacher's description of an equation on p. 143, ll. 2-3 and 5-6?

4. Instead of giving only one written example for the whole class and spending the last five minutes on oral multiplication (p. 150), the teacher might have set six or more examples for pupils to work on note-books at their own pace. Why would this latter method have been preferable? If this method had been used, how could the teacher have dealt with the pupils who had failed to understand the new rule? (Cp. Waples, *Procedures in High School Teaching*, pp. 129-31.) Make out six examples for use in the way suggested. What principle would govern your choice?

XVII

MUSIC—WOOD-WIND INSTRUMENTS

CLASS: Third-year (age 13-14), of 38 boys

Teacher. Some of you boys are going to the orchestral concert on Monday night. To many people an orchestral concert is just a confused jumble of sounds, because they can't pick out the sound of the various instruments. To-day I am going to help you to recognise the sound of four of the wind instruments, so that you can pick them out at the concert on Monday. The first I want you to hear is the piccolo.

Demonstration of the piccolo by means of the gramophone.

Teacher. Now try to remember it. Here is the flute. I want you to remember this one too, because if you can read the score you will know how the orchestra is going to sound before you go to the concert. Now listen to the flute and compare it with the previous one.

Demonstration of piccolo and flute.

Teacher. Now tell me the difference between the flute and the one before.

Pupil. The pitch of the second one is lower.

Teacher. And now you come to another type.

Demonstration of the oboe.

Teacher. Notice the pitch and especially the quality. What do you think of it?

Pupil. It is harder.

Teacher. Yes, nasal, as if someone was talking like this. (Talks through his nose.) If there is a nasal quality about the instrument you are hearing, then it is the oboe. Now compare the clarinet.

Teacher. What does the clarinet remind you of?

Pupil. The flute.

Teacher. Yes. That is where the difficulty comes in. Just let us see by hearing the flute again.

Demonstration of the flute.

Teacher. Now listen to the clarinet again.

Demonstration. Can't you hear any distinctive quality?

Pupil. Yes. The flute is clearer.

Teacher. Yes, but if you hear an instrument like the flute, but not quite the same, then it is the clarinet. The piccolo has a certain quality that you remember; the flute comes along and, compared with it, it is thicker; the oboe gives you a nasal note; and then there is the clarinet, which is something like the flute, but sounds huskier.

Teacher. Now let us try to pick out the different instruments again. Raise your hand when you think you hear the flute. Don't merely raise it because the boy next to you does it. I would rather have a hundred mistakes than have a copy.

Demonstration on the gramophone.

Teacher. What is that?

Pupil. The oboe.

Teacher. Yes, it sounds like the oboe. Notice the pitch of it. Is that the pitch of the oboe? Now I will go back and play it over again: listen to the pitch.

Demonstration of the piccolo.

Teacher. Is that it? No. That was really a little catch. It was the piccolo. Now listen to this.

Demonstration.

Teacher. Is that a flute?

Pupil. Yes. It is clearer than the clarinet.

Teacher. I want you to try and distinguish the quality. Was that clearer or was it huskier?

Pupil. I think it was the clarinet.

Teacher. Do you? Well, just compare them.

Demonstration.

Teacher. Which was the clarinet of those two?

Pupil. The first one.

Teacher. Yes.

Teacher. Now you are going to hear three instruments played. The first instrument starts, then another begins, and then the third one comes in. Try to tell me the order and what they are.

Demonstration of three instruments in turn.

Teacher. Now there are the three of them. I will play them again, so that you can decide. (Demonstration.) Was the first one clearer than a flute or was it huskier?

Pupil. Huskier.

Teacher. Then it was a clarinet. Tell me the next one.

Pupil. An oboe.

Pupil. A flute.

Teacher. Stick to it. I like independence. Well, let us try again.

Demonstration repeated.

Teacher. Hands up those who think the middle instrument was nasal. Hands up those who thought it was not nasal. The

first thing required is to hear it. All the boys in this class have minds and ears, but some of you will not hear it. Some are defective in hearing, just as some are colour-blind. In this case, however, it is very difficult to distinguish, because the pitch of the instruments is in the same place, and it is hard to tell whether it is a flute or clarinet.

Demonstration again.

Teacher. Hands up those who thought it was huskier.

Hands up those who thought it was not huskier. When I say husky I do not mean to say that it was not clear. Hands up for the nasal tone. Now let me play them again.

Demonstration.

Teacher. The clarinet is fluted, but it has a cold. Now just listen to the oboe again. The boy who gave the second one as the oboe was perfectly right. The instrument is talking through its nose.

Now to the boys who are going to the concert on Monday night there is one hint. You don't need to pay 4s. 6d. for a gramophone record to get to know the instruments, but you can learn to pick out the various instruments by fixing your eyes on them when you see the orchestra. But here are some pictures of them. Look at their mouthpieces. (Shows pictures of the four instruments.)

Record of "Morning" from Grieg's "Peer Gynt" Suite is played.

Teacher. Now the strings are being played. Can you tell me what instrument you would score to describe the morning.

Pupil. The violins.

Teacher. Now here come the wood-winds. What are we having, oboes or flutes?

Pupil. Oboes.

Teacher. And when the birds are singing what do you have?

Pupil. The flutes.

Teacher. Well, we shall just listen, but before we go any further please pick out the phrases. You cannot listen properly until you have done that.

Boys pick out phrases while teacher plays piano.

Teacher. Well, listen to those little bits, or phrases, and see if you can pick out the instruments playing. This is "Peer Gynt" Suite, by a Norwegian composer, Grieg.

Demonstration.

Teacher. Now I am going to play "The Bluebells of Scotland" in different ways. See if you can pick out the different composers' styles.

Demonstration.

Teacher. Who is this?

Pupil. Schubert.

Teacher. Because?

Pupil. He always repeats.

Teacher. And who is this?

Pupil. Grieg.

Teacher. And who is this?

Pupil. Beethoven.

Teacher. But (pointing to a bust of Beethoven) look at Beethoven's lips. Beethoven could not play it like this.

Demonstration of Peer Gynt on gramophone.

Teacher. Now listen: flute, oboe—here is another one, the flute—and oboe. These two instruments are having a little talk. Words get heated and then they start to fight. Notice how the flute imitates the oboe and they go on like this until there is quite a fight. Listen: there is a flute talking away—

a member of the oboe family, in imitation of it. When that instrument comes to the end of a phrase you will hear another one, which is rather more insistent. Then they come together and now they are having it out. But listen: what instruments are cutting in?

Pupil. The violins.

Teacher. Now raise your hands at the phrasing. There is a repeat à la Schubert.

QUESTIONS AND EXERCISES

1. On what grounds would you classify this lesson as belonging to the drill rather than the appreciation type?
2. Drill involves the setting of a pattern or model for the class to imitate or learn from. What patterns were used in this case?
3. The ultimate objective in drill teaching is to teach a skill in the way in which it will be used. What was the ultimate objective of this lesson?

In practical teaching most skills have to be analysed into simpler exercises, leading by gradual steps to the ultimate objective. (Cp. Waples, *Procedures in High School Teaching*, pp. 272-7.) Name the steps by which this teacher progressed from simpler to more difficult skills. Prepare in outline a series of similar steps designed to develop a skill required by pupils learning your own subject.

4. Good drill teaching requires from the pupils a particularly high standard of attention, which in turn depends on adequate motivation. On what motives did the teacher depend in this lesson? Were they sufficient to maintain interest and attention during the whole period? What other motives might he have used?

5. How did the teacher introduce elements of variety into the lesson? Were these changes justified?

6. Ideally, drill should be individual. Practically, with a class of thirty-eight boys (as in this lesson) Colvin's maxim "The few should never be drilled at the expense of the many" has to be borne in mind. How did the teacher of this lesson try to make the drill as individual as possible? What other methods might have been used for this purpose? How would you apply these and/or other methods of drilling the individual without sacrificing the group, in exercises in your own subject outlined under Question 3?

